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PROSPECTIVE INDUSTRIES

A treatise intended for the small capitalists to
provide them with detailed methods
of manufacturing the varied
articles of every
day use.

By
AN INDUSTRIALIST.

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INDUSTRY BOOK DEPT.,

KESHUB BHABAN,
SHAMBAZAR, CALCUTTA

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Prospective Industries.



INTRODUCTION.

ONE of the most outstanding problems to the industrial community of India is the selection of special lines of industries which promise to afford lucrative occupations to the small capitalists specially. The various avenues of employment open to our young men of limited means may here be briefly surveyed.

AGRICULTURE AND ALLIED INDUSTRIES.

India being pre-eminently an agricultural country, industries connected with agriculture deserve our special attention. Food production is an item in our national economics which ought to interest our capitalists. It possesses a unique advantage in that it offers scope to any amount of capital great or small. The prospective agriculturist can undertake cotton cultivation, sugarcane cultivation, etc.

on an extensive scale while the humble farmer can take to kitchen gardening or fruit culture. Allied with such an occupation there are prospects in dairy farming, poultry keeping, duck-rearing, pisciculture, etc. With the founding of new towns and the growth of population in existing cities there will always be a great demand for fresh fruits, vegetables, fish, meat, milk, etc., etc.

So much on the actual productive side. The industries connected with the above may also be taken up with profit such as rice milling, flour milling, oil milling, oat grinding and the like. Next come canning of fruits, drying of vegetables, preparation of condiments for the utilisation of waste materials or production of animal feeds, such as straw chaffing, nut shelling, thrashing, etc. Even the manufacture of fertilisers such as bone crushing and oil cake grinding will be found paying.

The manufacture of milk products is greatly facilitated by dairy utensils such as churners. There is a great demand for a rightly conducted creamery, there being a scarcity of butter and *ghee*.

There are many simple appliances which considerably help even a novice to take to poultry rearing, bee keeping, etc. Hatching eggs with incubators is remunerative.

India with her long sea-coast has little to boast of sea-fishery. Apart from the fishes intended for consumption many useful substances such as fish oil, fish meal, isinglass, etc. can be extracted from them.

FOOD FOR HUMAN CONSUMPTION.

Industries connected with the final stages of food production have many advantages. Being articles of human consumption there is always a ready market for them. We cite a few concrete cases. A bakery can be started for the preparation of bread, cake, biscuits, etc., a confectionery for lozenges, drops, chocolates and other comfits; a food preserving plant for making jam, jelly, marmalade and pickles. Fruits can also be preserved by bottling and vegetables by desiccating and drying. In this connection a *roaring* business may generally be expected from mineral water industry and ice making in country like ours

DOMESTIC HANDICRAFTS.

We naturally pass on to a class of industries which can be conducted in spare time at home with inexpensive hand machines. These are more suitable for *purdanashin* ladies and even one can count upon the assistance of boys and girls in the family. The most suitable occupation for our womenfolk would be spinning, weaving, cotton carding, silk-reeling, etc. Hosiery is lucrative at the present time. There are many things that can be knitted at home—stockings full and half, guernsey, jersey, bodice, chemies, knotted hose, and the like. Knitting may be done in cotton, silk, wool, artificial silk, mixture, dyed and undyed yarns. Even neckties, collars, comforters and gloves may be knitted on simple appliances. We then pass on to sewing and embroidery. Handkerchiefs, napkins, towels, tablecloths and covers are easily sewed or knitted. Among needle works of art and value may be mentioned lampshades, fringers, curtains, braids, trimmings, scarfs, motifs, gold and silver brocade cloth, etc. In crochet work the following may be taken up, laces, ladies' handbags, purses, etc.

and even hair nets and hair lace. Combined with beads, glass or wooden, aesthetic results may be obtained such as bead trimmings, beaded bags, etc. In this line also are included ribbon making, lace making, tape making, cord making, etc. Shoe lace, silk ribbons, lamp wicks, red tape are readily saleable articles. Then come thread balling, spool, etc. A novelty in this line would be the preparation of paper laces and capsules which are found on the inside of soap boxes and on stoppers of bottle. These can be made from redundant strips of paper with small machines. All of these entail light labour.

Basket weaving, cane and wicker-work, etc are also suitable. Mat weaving and straw-plaiting can be done with the help of machines.

A very pleasant occupation is furnished by artificial flowers from paper and wax or artificial fruits from wax and clay or papier mache. These require careful manipulation and aesthetic taste.

TOY AND SPORT.

Articles of juvenile interest attract our notice next. Toys, sporting outfits, requisites

for games and pastimes, etc., are in universal demand. There is money in industries connected with them. Specially does this remark apply to the making of dolls and toys for children the materials for which are generally supplied by the waste products of many manufacturing concerns. We will indicate a few directions where to find such waste materials which can be profitably utilised: Cotton, silk and wool wastes from the textile mills with which to stuff dolls and animals or for dress trimmings; waste paper from printing and book binding trade to be converted into papier mache; scrap tin and iron from can making firms to make bugles, swords, cars: cardboard refuse to print puzzles and caricatures on: wood rejects to make animals on wheels, doll's furniture, also tinsel ornaments. In fact all sorts of grotesque and amusing toys can be made from the leavings of established trades. Puzzles, balancing or nodding figures, magical apparatus, joke articles, etc., can be made as well as indoor games. Toys and dolls, etc. can also be cast from clay, cement, or molten lead or other alloy.

A great many articles can be made from thin coloured papers such as, flags, festoons, balloons, paper lanterns, etc. which are used for decoration purposes.

It should be mentioned in this connection that there is a vast field for the manufacture of pyrotechnics.

ARTICLES THAT CAN BE MADE.

We will next suggest a list of articles of every day necessity the manufacture of which can be undertaken by fitting up a small workshop with simple machine tools

Traps for rats, mice and other animals; wooden barrels, chair, table and other furniture; bookmarks from pasteboard or celluloid; brushes of different kinds from animal, vegetable and mineral fibres; brooms and mops from coconut husks; felt caps, straw hats, sola topee, etc.; box handles, screw hooks, hat hooks, cloth hangers, trouser stretchers, curtain fittings, clamps; wire gauge covers for food, dish covers, strainers and colanders, dog chain, watch chain, umbrella rings, cigar lighters and other stationery tidbits.

A list of other articles that can be made follows:

Thermometer cases, cigars and cigarettes holders, ash trays, lemon squeezers, oil pots, funnel, tray, embossed and engraved cases for powder, soap, etc., doorlocks, bolts, padlocks, pencil caps, penholders, tubes and buckets of different size and shape, steel and tin trunks, attache cases of artificial leather or compressed fibre, rings, hooks, pegs, drawing board pins, paper clips, eyelets, furniture accessories, such as hinges, lock, box handles, brace, buckle, belt, brooches, chains, cuff-links, studs, safety pins, pendants, garters, sleeve holders, and other items of haberdashery, hair ornaments, slide-pins, upholsters' tacks and nails, candle stick, spoons and forks, photo frames, frames for hand bags, horse trapping, bridle bits, stirrups, spurs, etc.; lamp accessories, collapsible tubes, picture frames, mountings, bolts and rivets; carbon paper and typewriter ribbons, crown corks, horn handles for stick and umbrella, diamond cutters for glass, money bag clips, fountain pen clips, letter openers, paper cutters, pen rests, inkstands, letter clips, stamp racks,

paper weight, etc.; other office requisites, rubber stamp holders.

Indeed many are the articles that can be prepared from metallic wires or sheets and suggestions for these can be received from any stationery shop or emporium of fancy goods.

THE POSSIBILITIES OF WORKSHOPS, ETC.

So long we have spoken of articles which can be produced or manufactured. We will now suggest a few plans in which the services of an establishment can be let out on hire, so to speak.

There is just now a necessity in the country for a bleaching and dyeing establishment. Connected with it a demand also exists for an up-to-date laundry, wet or dry cleaning, with mechanical equipments for ironing, glazing, etc. Baling presses for compressing cotton, jute, etc. for shipment are also paying. A book-binding shop must be replete with accessories for cutting, binding, wire-sticking, paper ruling, etc. Work will always be found for small printing establishment in district towns.

A desideratum is felt for a well-equipped refrigerating plant for bottle cleaning, wash

ing, filling, corking and labelling. The services of such a plant will be found inestimable by patent medicine and hair oil makers, also for making crown corks. A business that would cater for mirroring, renovating, etching, painting of glass will be paying. With a few chemicals and appliances looking glasses can be artistically decorated with pictures, and signs. Establishments for stove enamelling and nickel plating are also very profitable. Arrangements for briquetting coal dust, etc. may be set up in the coal districts.

A workshop equipped with autogenous welding and an acetylene cutting apparatus or oxy-hydrogen blow pipes can undertake repair of heavy machineries.

MATERIALS TO USE.

We will now enumerate the materials from which the majority of the above mentioned articles can be prepared. Of all such materials metallic sheets and wires stand foremost. A variety of things can be made from them. Trunks are made from iron sheets, buckets from corrugated iron sheets, cans from tinned iron sheets, utensils from brass sheets,

etc. Good and silver leaves are required for enamelling and other purposes while lead and zinc foils are used for covering pasty masses. Celluloid can be had in sheets and spirals, from the former comb may be made and from the latter bangles. Artificial ivory and horn will make handles for knives and sticks.

Amber, bakelite, ebonite, galalith are a class of materials, which furnish the basis of many small articles such as fountain pen cases, penholders, rulers, cigar holders and pipes, paper cutters, etc. Ebonite can be had in sheet, rods, tubes, etc. Many are materials required in the book-binding trade such as steel wire, marble paper, bronze powders, etc. Glass beads are turned to useful account in ladies' hand bags while beads of wood, wax, and celluloid are also needed. Artificial glass eyes, etc. are required in the toy making trade; diamond is applied in many industrial purposes such as boring tools; felt has its technical uses. Many are the cheap gaudy articles that can be made from artificial gold, imitation silver, rolled gold, platinum, etc. Buttons, earrings, etc are made from mother-of-pearl while ivory can be

put to a variety of uses. Paints, varnishes, and enamels are very valuable materials in many industries. A large number of articles are to be preserved by coating with them. There is a kind of varnish from which window envelopes can be easily made. Emery glass, flint paper, etc. are necessary for polishing purposes. Boot, shoe, holdalls, gladstones, etc. are made from leather. From artificial leather or vulcanised fibre may be made attache cases, money purses, table covers, chair covers, etc. Among other materials may be mentioned cork and cork goods, boots eyes and clamps, rubber, caoutchouc, etc. Some of the materials for fire works, besides chemicals are: metal filings, aluminium powders, bamboo sockets, paper tubes, etc. In the preparation of mineral waters and food-stuffs non-poisonous colours should only be employed. Inoffensive essences and flavours are also to be used for a similar purpose.

TOOLS AND IMPLEMENTS.

A few elementary tools and implements are all that will be required for the operation according to the suggestions made above. Of

course it will be better if a small machine shop can be fitted out. The following appliances will, however, be fundamentally necessary.

File, saw, screw driver, hammer, shear, pliers, pincers, stocks and dies, twist drills, benches and vices, boring gears, scooping apparatus, drilling machines, screw-cutting dice, brass tools of precision, besides grinding and polishing machines, corundum wheels.

One or two lathes, bending machines, sheet cutting, stamping, punching machines will be valuable additions. A small oil engine may in some cases be deemed necessary.

A FEW OPENINGS.

In addition to the articles mentioned above, the manufacture of which can be undertaken with profit, there are definite prospects in the following industries.

(1) Brick and Tile making; burnt and unburnt bricks from clay, tiles, from cement or artificial stone.

(2) Cigar and cigarette making; preparing snuff, etc. from the waste.

(3) Hosiery and hose knitting: mantles, etc.

(4) Steel trunks, cash boxes, deed boxes, canisters, etc

(5) Buckets, bath tubs, drums, milk cans, acetylene holders, etc.

(6) Cutlery: knives, scissors, spoons, forks, surgical instruments, manicure sets, drawing instruments.

(7) Garden implements: shears, pruning knives, hoes, cutters, clippers, etc.

(8) Leather goods: boots, shoes, gladstone bags, holdalls, traveller's bags.

(9) Kitchen utensils of sheet metal; cups, dishes, saucers, tumblers, pans, *deckchûs*.

(10) Invalid foods, etc.

SMALL INDUSTRIES

Besides those mentioned above there are lots of small industries which may be profitably undertaken. The requirements of the public are growing by leaps and bounds and if a careful observation is made of the daily necessities of life we will get clue to many a useful industry.

The industries referred to above are too numerous to be fully dealt with in a small book like this. They more often than not

require a technical skill which can only be acquired from workshops and continued practice. In the present treatise we are concerned with a limited few of them, which are mainly based on scientific and technical knowledge, for example, the manufacture of boot polishes, depilatories, dental preparations, hair dyes, cements, crayons, *tambul bihars*, incense sticks, etc., etc. These and similar industries as suggested by observation have huge possibilities, can be started with a small capital and admit of expansion when the demand is created by excellence of quality, get-up and organisation.

MANUFACTURE OF BOOT POLISH.

BOOT polishes form one of the most indispensable accessories of modern civilization. Every gentleman feels it incumbent upon him to dress smartly with shining footwear. The manufacture of some meritorious and saleable boot and shoe preparations affords one of the best opportunities to become independent with little capital. To carry out the operation successfully the manufacturer should bear in mind the distinction between Blacking, Polish and Cream. The two main constituents of blacking are the bone-black and fish or linseed oil. It is generally applied to the leather with water and rubbed with a hard brush to impart a brilliant gloss. But now-a-days boot polishes and creams have readily supplanted blackings. The basis of all modern polish is wax, beeswax admixtured with a certain percentage of carnauba wax to impart shining properties, the vehicle being oil of turpentine. It is applied thinly over the leather and gently rubbed with a piece of soft

cloth when a polish will result. The ingredients of cream are almost the same as that of the polish with the addition of soap. This ensures detergent properties and assists in keeping the leather soft and supple. These are the main characteristics of the three kinds of shoe dressings which are in universal use.

CHARACTERISTICS OF A GOOD POLISH.

It should be the endeavour of the manufacturers to arrive at a preparation which not only offers a brilliant polish on the shoes on simple application without much rubbing but also imparts to it additional qualities. The polish should last long and can be revived when dimmed with dust by simple brushing. It should protect the shoe from the action of heat and water and render it supple, non-sticky and waterproof. It should also furnish the ingredients of which the leather is being exhausted so that its life is prolonged.

We append a few well-tried recipes for these readily saleable articles.

BLACKING.

| | |
|------------|--------|
| Bone black | 7 lbs. |
| Treacle | 7 lbs. |

| | |
|---------------------------|----------|
| Boiling water | 4 pints. |
| Commercial sulphuric acid | 2½ lbs. |
| Fish oil | 1 pint. |
| Vinegar | q. s. |

PROCEDURE:—Mix the bone black, treacle and boiling water; then add the sulphuric acid with care because great heat is evolved during its addition and is liable to convert the greater portion of lime in the bone black into sulphate of lime which causes a thickening of the mixture. After this the mixture is set at rest for some hours and then mixed in the oil. If the mass is found to be highly viscous, it is reduced to the desired consistency with the addition of vinegar.

~ The bone black must be in the form of impalpable powder otherwise the paste will be grainy. The fish oil may be bleached by exposure to the sun for a few days or by passing steam through it. To mask its bad odour a little nitrobenzine may be added.

SHOE POLISH.

| | |
|-------------------|-----------|
| Yellow wax | 10 parts. |
| Oil of turpentine | 1 part. |
| Potash | 2 parts. |
| Molasses | 2 parts. |

| | |
|-----------|------------|
| Water | 100 parts. |
| Lampblack | q. s. |

PROCEDURE:—Melt the first three ingredients together and treat with molasses and water. Then stir the resulting mass with enough lampblack to colour it deep black.

FLUID BLACKING FOR SHOES.

| | |
|---------------------|------------|
| Asphaltum | 500 parts. |
| Petroleum | 500 „ |
| Linseed oil varnish | 60 „ |
| Train oil | 140 „ |
| Alcohol | 130 „ |

PROCEDURE:—Make a mixture of 500 parts of asphaltum and 500 parts of petroleum to which add first 60 parts of linseed oil varnish, then 140 parts of train oil and finally 130 parts of alcohol.

HARNESS BLACKING.

| | |
|-------------------|-------|
| Mutton Suet | 2 oz. |
| Yellow Wax | 6 oz. |
| Powdered Sugar | 4 oz. |
| Yellow Soap | 2 oz. |
| Lampblack | 1 oz. |
| Indigo | 4 oz. |
| Oil of Turpentine | 4 oz. |

PROCEDURE:—Dissolve the soap in the water; add the other ingredients except the

turpentine; melt and mix together thoroughly; then add the turpentine. This mixture is applied with a sponge and polished with a brush.

WATERPROOFING BOOTS AND SHOES.

PROCEDURE.—For waterproofing boots and shoes put some beeswax in a jar, well cover with castor oil and stand on the hob till the wax melts. Stir, and allow to get cold, when it should look like dubbing; if it is too thick add more oil. Now warm it again, and while soft apply to the leather with a stiff brush. Warm the boots before a slow fire, then give a second coat. If desired, a little lamp-black or gas black can be added. The oil dries in and helps to waterproof, and the wax forms a coating through which water does not penetrate.

BOOT POLISH.

In making boot polishes and creams, both beeswax and carnauba wax are used on a large scale. They may be unbleached except in the case of white cream. They should be cut into slender pieces before use.

The turpentine oil is an inflammable substance and hence it should not be brought near the fire. When it is added to the melted wax, the pan should be removed at a safe distance from the fire before any addition of turpentine is made.

Cast iron pans are mostly used during the melting of waxes.

BLACK.

I.

| | |
|-------------------------|------------|
| Beeswax | 2½ lbs. |
| Carnauba wax | 1¼ lb. |
| Caustic soda lye 40° Be | 8 fl. oz. |
| Turpentine oil | 6 pints. |
| Nigrosin | 1¾ lbs. |
| Water | 2 gallons. |

PROCEDURE:—Shred the waxes and melt them together by the aid of heat. Add the caustic soda lye and stir until saponification is complete and the mass becomes homogeneous. In the meantime dissolve the nigrosin in turpentine oil in a separate vessel. Now mix thoroughly when the former is still tepid warm. Lastly, boil the water and pour down slowly over the mixture. The mass should be put into suitable tin boxes when it reaches

honey-like consistency in cooling down. This should set as in a mould.

II.

| | |
|----------------------------------|--------|
| Beeswax | 4 oz. |
| Carnauba wax | 1½ oz. |
| Ceresin | ½ oz. |
| Turpentine oil | 15 oz. |
| Yellow soap | 1½ oz. |
| Nigrosin (oil soluble to colour) | q. s. |
| Water | q. s. |
| Bergamot oil | q. s. |

PROCEDURE:—Cut the soap in thin slices and dissolve in smallest quantity of water by gentle heat. Melt the waxes together, then add the oil of turpentine (after taking away the pan from the fire) and incorporate thoroughly. Now add nigrosin into it and stir in the soap solution and continue stirring until cold. The amount of turpentine may be used more or less according to the consistency of the paste desired. A few drops of bergamot oil may be employed to eliminate the undesirable odour.

III.

| | |
|----------------|-----------|
| Bone black | 40 parts. |
| Sulphuric acid | 10 „ |

| | | |
|------------------|-------|---|
| Fish oil | 10 | ” |
| Sodium carbonate | 18 | ” |
| Sugar (common) | 20 | ” |
| Liquid glue | 20 | ” |
| Water | q. s. | |

PROCEDURE:—Soak 10 parts of good white glue in 40 parts cold water for 4 hours and then dissolve by the application of gentle heat and add 1.8 parts glycerine. Set aside.

Dissolve sodium carbonate in sufficient water to make a cold saturated solution and set aside.

In an earthenware vessel, moisten bone black with very little water and stirring it with a stick, add sulphuric acid slowly. Agitate until a thick dough-like mass is obtained and then add and incorporate the fish oil, a little at a time. Add the sodium carbonate solution, in small quantities, with vigorous agitation until effervescence occurs. (Be careful not to add so freely as to liquefy the mass). Stir until effervescence ceases and then add molasses or sugar, the first, if a damp soft paste is required, and the second if a drier one is required. Finally, add in small quantities, with constant stirring, sufficient of the solu-

tion of glue to make a paste of the desired consistency. The exact amount of glue to be added is to be learned by experience, as no empirical rules will hold in this case.

IV.

| | |
|----------------------------------|-----------|
| Carnauba wax | 10 parts. |
| Beeswax | 20 " |
| Caustic soda solution (40°Be) | 4 " |
| Nigrosin (fat soluble) | 15 " |
| Water (hot) | 160 " |
| Turpentine oil | 60 " |

PROCEDURE:—Melt the carnauba wax and beeswax together, add the liquor and continue to warm till saponification takes place and the mass becomes homogeneous. Let the mass cool down to 140°F and gradually add the colour which is dissolved in the turpentine oil warmed to 125°F.

V.

| | |
|--------------------------|--------|
| Nutgalls | 3 oz. |
| Borax | 2 oz. |
| Lac | 1½ lb. |
| Aniline black | 1 dr. |
| Ivory black or Lampblack | 3 oz. |
| Water | q. s. |

PROCEDURE:—A black water-proof polish for boots and shoes, may be made as follows: Procure 3 oz. of nutgalls, 2 oz. of borax, $1\frac{1}{2}$ lb. of lac, 1 dr. of aniline black, and 3 oz. of ivory black or lamp black. Place the nutgalls in 1 gal. of water, and simmer over the fire until all the tannin is extracted. The liquid is then strained, replaced on the fire, and raised to boiling heat; the borax and lac are then placed in, and the mixture is simmered until the lac is thoroughly dissolved, after which the aniline black may be added, followed by the lamp black. The mixture is allowed to stay on the fire a few moments, constantly stirring, then taken off the fire and passed through a fine strainer when it is ready for use. The mixture is applied to the leather by means of a sponge or brush; it dries with an enamel-like surface which is quite water-proof. The composition should be thoroughly stirred or shaken before using.

PATENT-LEATHER POLISH.

| | |
|-------------------|--------|
| Yellow wax | 3 oz. |
| Spermaceti | 1 oz. |
| Oil of turpentine | 11 oz. |

| | |
|-------------------|-------------|
| Asphaltum Varnish | 1 oz. |
| Borax | 80 grains. |
| Ivory black | 1 oz. |
| Prussian blue | 150 grains. |

PROCEDURE:—Melt the wax, add the borax and stir until an emulsion has been formed. In another pan melt the spermaceti and add the varnish just dissolved in oil of turpentine. Now stir well and pour down to the melted wax. Finally add the prescribed amounts of ivory black and prussian blue and incorporate the ingredients thoroughly.

BROWN.

I.

| | |
|-----------------------|-------|
| Yellow wax | 4 oz. |
| Pearl ash | 4 dr. |
| Yellow soap | 1 dr. |
| Spirits of turpentine | 7 oz. |
| Phosphine (aniline) | 4 gr. |
| Alcohol | 4 dr. |
| Water | q. s. |

PROCEDURE:—Scrape the wax fine and add it, together with the ash and soap, to 12 oz. of water. Boil all together until a smooth, creamy mass is obtained; remove the heat and add the turpentine and the aniline (previously

dissolved in the alcohol). Mix thoroughly, and add sufficient water to bring the finished product up to $1\frac{1}{2}$ pints.

II.

| | |
|-------------------|-----------|
| Yellow wax | 30 parts. |
| Soap | 12 " |
| Nankin yellow | 15 " |
| Oil of turpentine | 100 " |
| Alcohol | 12 " |
| Water | 100 " |

PROCEDURE:—Dissolve on a water bath, the wax in the oil of turpentine; dissolve also by the aid of heat, the soap in water and the Nankin yellow (or any other coal tar colour) in alcohol. Mix the solutions while hot, and stir constantly until cold. This preparation is smeared over shoe in the usual way and rubbed away with a brush until evenly distributed and finally polished with an old silk or cloth.

III.

PROCEDURE:—Proceed as in (I) under Black Boot Polish: only use Bismark brown instead of nigrosin and dissolve it in water instead of in turpentine oil as stated in the recipe (*page 21*).

IV.

PROCEDURE:—Proceed as in (II) under Black Boot Polish: only use Bismark brown instead of nigrosin in oil.

BOOT CREAM.

Recipes of white and coloured creams are given below.

WHITE CREAM.

I.

| | |
|------------------|----------|
| Bleached Beeswax | 1 lb. |
| Carnauba wax | 1 lb. |
| Ceresin | 12 oz. |
| Turpentine oil | 6 pints |
| Yellow soap | 22 oz |
| Water | 8 pints. |
| Liquor Ammonia | q.s |

PROCEDURE:—Melt the waxes together and pour the turpentine oil after removing the molten mass away from the fire. Dissolve the soap in boiling water in a separate vessel and gradually pour the hot solution over the waxes and mix thoroughly. Now shake well until the whole is emulsified. Finally add a small amount of liquor ammonia to impart agreeable scent and put into suitable glass bottles.

II.

| | |
|------------------|----------|
| (A) Bleached wax | 1 lb. |
| Ceresin (wax) | 6 oz. |
| Turpentine oil | 3 pints. |
| (B) Soft soap | 11 oz. |
| Water | 4 pints. |
| Liquor Ammonia | q. s. |

PROCEDURE:—Melt the waxes together; and add the turpentine at a safe distance from the fire. Again dissolve the soap in water by gentle heat. Thoroughly mix (A) and (B) while still hot. Shake well until the whole mixture is well emulsified. Add some liquor ammonia to impart agreeable scent and bottle in suitable glass phials.

BLACK, BROWN, ETC.

I.

Black and brown boot creams will be obtained by incorporating respective aniline dyes to the white basis. For these purposes, however, ordinary beeswax may be used in place of bleached wax.

For a black cream use nigrosin (water soluble); and for a brown cream Bismark brown (water soluble) gives a good result, but as this dye imparts the leather with a deeper

brown colour by repeated applications, it can be replaced by phosphine substitute, the quantity of which must be determined according to tone of colour desired. If the aniline dyes are not desired, the natural colouring matter, such as dragon's blood, turmeric, annatto, etc., may be used, and they should be digested in the turpentine oil previous to dissolving the wax therein.

For black use Nigrosin 1 oz. with aniline blue 1 dr. and for brown use Bismark brown 2 oz.

II.

| | |
|-----------------------------|-----------|
| Beeswax | 4 lbs. |
| Turpentine | 4 lbs. |
| Yellow soap | 2 lbs. |
| Water | 9½ pints. |
| Aniline dye (water soluble) | 8¼ oz. |

PROCEDURE:—Cut the soap in thin slices and dissolve in the water by boiling; in the meantime dissolve the wax in turpentine oil by carefully heating the two together in a separate vessel. Slowly pour this into the soap solution, and briskly stir the mixture until the mass is cooled down and is of a creamy consistency. If the stirring be not continuous

during the time of cooling, the wax will granulate and separate out, whereas by constant stirring the mass acquires a creamy consistency. Owing to the presence of turpentine, aniline dyes cannot be mixed with the cream after it is made but by dissolving them in the water before it is used in dissolving the soap. In this way the mass can be coloured by any of the aniline dyes soluble in water.

III.

| | |
|-------------------|-----------|
| Beeswax | 60 parts. |
| Carnauba wax | 15 " |
| Carbonate of soda | 6 " |
| Yellow soap | 6½ " |
| Water | 550 " |
| Formalin | 1 part. |
| Aniline Colour | q. s. |

PROCEDURE:—Melt the waxes together and in a separate vessel dissolve the soap, the soda and the aniline dye, if coloured preparation is desired, by the aid of heat. Now gradually add the hot solution to the melted wax with continuous stirring. For black use nigrosin and for brown use Bismark brown.

DRESSING FOR CANVAS SHOES.

Blanco is a leather renovator used for white canvas and white leather materials.

Only two or three materials are employed in the preparation and these materials are cheap and abundant in our country. Kaolin or white earth which is used for making white caste-marks on the forehead is the body-forming material in blanco. This material can be had only for the cost of collection where deposits of kaolin exist. Starch, gum or both are added to make it stick to the surface and give a sort of glaze to the paste when dry.

PREPARATION OF THE CLAY.

The difficult process in the manufacture is the washing of the white clay. In order to separate sand, colouring matter and other impurities from the clay it is first soaked in water and digested. Then it is sifted through a fine piece of muslin whereby the fine particles of clay are allowed to pass through the meshes of cloth with water into a pot. There it is allowed to settle and the supernatant liquid decanted. By repeating this operation twice or thrice only, very fine particles of clay can be separated and dried into lumps. When a still finer quality is required, it is allowed to ferment with the help of milk or lime juice

and worked. By fermentation, a natural mucilagenous condition is acquired. But it will not be enough to make it stand the rough handling. Consequently artificial mucilages such as starch, gum, &c. are added.

MOULDING.

Before moulding, the mass has to be reduced to a condition that it may not yield to the touch after being moulded. Excess of water that may be found in the mass may be made to be absorbed by pouring the composition-like mass in a pit made in a heap of ashes with a covering of a fine muslin thereon. The muslin is only to prevent any ashes getting into the clay. The process has only to be taken recourse to when there is no time to evaporate the excess of water by means of natural evaporation. Any workman who knows the turning of wood by means of a hand lathe is able to prepare a mould when he is shown the shape of a blanco cake. It is in the form of thick round cake with a pit about one inch deep and about $1\frac{1}{2}$ inch diameter. This pit is to serve as a cup for dissolving the composition by means of a soap brush.

PREPARATION.

Having obtained the mass as above with a slight admixture of blue colour in order to improve the whiteness of the mass it has to be incorporated with one ounce of liquid gum obtained by dissolving gum in four times the weight of water. In order to render it readily soluble in water one-sixteenth part by weight of good lathering soap has to be incorporated in the mass. Care should be taken that all lather subsides at the time of moulding. When the mass is ready, it is to be pressed in the mould and dried. It will take about 5 or 6 days for the lump to dry. These may be packed up, four of them being rolled up in paper with the necessary printing thereon. With an engraving at the bottom of the top press of the mould, necessary inscriptions can be impressed on the cakes.

A few recipes following:—

CHALK WHITE FOR CANVAS SHOES.

| | |
|--------------------|--------|
| Pipe clay | 16 oz. |
| Spanish whiting | 8 oz. |
| Flake white | 6 oz. |
| Precipitated chalk | 4 oz. |

| | |
|---------------------|-------|
| Powdered tragacanth | 2 oz. |
| Carbolic acid | 2 dr. |

PROCEDURE:—Mix the powders and knead with water. Divide the paste into small pellets and cast each into suitable moulds.

DRESSING FOR CANVAS SHOES.

| | |
|-------------|---------|
| Water | 3 gals. |
| Pipe clay | 10 lb. |
| Shellac | 3 lb. |
| Borax | 1½ lb. |
| Soft soap | 3 oz. |
| Ultramarine | 2 oz. |

PROCEDURE:—Pipeclay and borax should be powdered and the shellac bleached. Boil shellac and borax in the water until dissolved; stir in soft soap, pipe clay, and blue. Mix well and strain.

This white dressing is used for canvas shoes. It will not easily rub off, nor yet scale, and is waterproof.

MANUFACTURE OF DEPILATORIES.

DEPILATORIES usually exist in the form of paste, cream (semi-liquid), soap (cake or stick), powder and pure liquid. Strenuous chemical analysis has shown that the ordinary depilatories, prevalent in the market, are composed of mere vulgar origin and unreliable ingredients. They are by no means safe and sure. Quack preparations on account of unscientific manipulations are ever treated with extremely crude materials resulting in excruciating irritation and perpetual skin troubles in course of repeated application. True chemical practice has however now regulated and standardised the criterion of the supreme product.

OLD FASHIONED RECIPES.

Here are some old fashioned recipes:—

I.

Orpiment, 2 parts; finely powdered quicklime and starch, of each, 22 parts; mix. It should be kept from the air. For use, make

it into a paste with a little warm water, and apply it to the part. As soon as it has become dry, it may be washed off with a little warm water.

II.

Quicklime, 2 lbs.; pearlash and sulphuret of potassium, of each 4 ozs.; reduce them to fine powder, and keep in well-stoppered phials. Use as number one.

LATER DEVELOPMENTS.

These crude recipes then gave way to the following:—

I.

A 25 p.c. to 40 p.c. of sodium sulphide alone is used. Dissolve 109.5 grains to 195.0 grains of sodium sulphide to an ounce of water. Apply twice or thrice, drying between each.

II.

Sodium sulphide, 6 parts; quicklime, 20 parts; starch 20 parts. Mix and keep in well stoppered bottles. Make a paste with water and apply. Remove with a blunt knife. Wash off with water.

MANUFACTURING PROCESSES.

The modern preparations are best made on the manufacturing scale thus:—

PASTE.

I.

| | |
|---------------------------------|---------------------|
| Sulphuret of barium | 1 oz. |
| Coleman's white starch | 1 $\frac{1}{4}$ oz. |
| Carbonate of potassium | $\frac{1}{2}$ oz. |
| Sweet oil | 2 dr. |
| Lemon grass oil (citronella) | 5 to 10 minims |

PROCEDURE:—Use a saturated solution of sulphuret of barium in a porcelain or glass mortar together with potassium carbonate and starch and triturate until their union is evenly complete. Then pour down sweet oil drop by drop and stir on very briskly. Now allow the mass to dry in the strong sun for an hour. Take it up and re-macerate for the second time with the addition of lemon-grass oil and pack up as quickly as possible.

II.

| | |
|--------------------|-------------------|
| Strontium sulphide | 1 oz. |
| Sodium hydroxide | $\frac{1}{2}$ oz. |
| Orris root | $\frac{1}{2}$ oz. |
| Kahi Istambul | 1 dr. |

| | |
|------------------|-------------------|
| Olive oil | $\frac{1}{2}$ oz. |
| Soapstone powder | $\frac{1}{2}$ oz. |

PROCEDURE:—Take finely pulverised orris root and strontium sulphide (strictly refined, not commercial) and macerate in a stone mortar for half an hour in combination with soapstone powder. Then damp the whole with a mild solution of sodium hydroxide and olive oil to form a coarse emulsion. Put the compound in a cool dry spot in a stoppered vessel for three uninterrupted hours. Lastly add istambul kahi and finish. The product thus obtained is simply innocent and free from the disagreeable odour and fit for use to the tenderest portion of the body.

Flavouring and colouring may be done as desired.

III.

| | |
|------------------|--------------------|
| Sodium Carbonate | $\frac{1}{2}$ oz. |
| Barium Sulphide | $1\frac{1}{2}$ oz. |
| Arrowroot | 1 oz. |
| Pulv. orris | $\frac{1}{4}$ oz. |
| Olive oil | 1 oz. |

PROCEDURE.—Don't use metallic vessels in the preparation. Macerate finely pulverised orris root and barium sulphide in a stone

mortar for half an hour with arrowroot. Now damp the whole with a mild solution of sodium carbonate and add olive oil to form a coarse emulsion. Macerate again thoroughly and pack.

IV.

| | |
|-----------------------------------|---|
| Sodium sulphide | 20 grs. |
| Calcium hydroxide | $\frac{3}{4}$ oz. |
| Sugar | $\frac{1}{4}$ oz. |
| Collodial kaolin or China clay | 1 oz. |
| Water | q. s. |
| Perfume | sufficient to cover the sulphuric odour. |

PROCEDURE:—Dissolve the sodium sulphide in $\frac{3}{4}$ oz. of water, stir in the slaked lime, mix with other ingredients and add more water until a cream or paste of suitable consistence is obtained. Lastly add the perfume to cover the sulphuric odour.

LIQUID DEPILATORY.

| | |
|-------------------|------------|
| Alcohol | 12 grams |
| Iodine | 0.75 grams |
| Collodion | 35 grams |
| Oil of turpentine | 1.50 grams |
| Castor oil | 2 grams |

PROCEDURE:—Apply to the part from which the hair is to be removed once or twice daily for 3 or 4 successive days, increasing from day to day the thickness of the layer.

DEPILATORY POWDER.

All the ingredients which enter into the composition of powder should be very finely pulverised and mixed up intimately, and put up into packets. For application required amount of powder for a single dose should be taken from the packet and mixed with water. The presence of the least moisture in the mass makes the entire preparation a failure.

I.

| | |
|-------------------|-------------------|
| Orris root | $\frac{1}{4}$ oz. |
| Calcium carbonate | $\frac{1}{2}$ oz. |
| Barium sulphide | 1 oz. |
| Borax | $\frac{1}{4}$ oz. |

PROCEDURE:—Take barium sulphide in the form of a lump and introduce into a mild furnace, preferably charcoal or coke for 5 to 10 minutes, when it will get decolourised yielding an ashy tint. Take out and cool down. Also treat calcium carbonate in lump in a similar manner. Put them together into a stone

mortar and triturate as finely as possible; next combine together orris root and borax according to the above process. Lastly make a union of both the products in the same mortar for half-an-hour. A teaspoonful of this powder serves for each application.

II.

A harmless depilatory is made as follows: Lime is slaked with a solution of 5 to 25 per cent. of sugar, and the calcium saccharate thus obtained is ground into small lumps and saturated with hydrogen sulphide. This product must be kept away from light and air.

For use this is mixed with talc, for example, and perfumed so that the final product contains 4 to 6 per cent. as a base. It is diluted with water until it forms a paste, which is applied to the spot from which it is required to remove the hairs. After five or ten minutes it is removed by scraping or by washing, and the hairs disappear at the same time without damaging the skin.

III.

Barium sulphide, 1 to 3 parts; wheat starch, 3 parts. When required, make into

a cream with water, spread on the part, let it remain five or ten minutes, then remove with a blunt knife.

IV.

Barium sulphide, 3 drams; zinc oxide, 12 drams; carmine, 2 grains. Make a paste with water and apply. Remove after a few minutes.

V.

Thymol, 2 parts; ether, 20 parts; and rectified spirit 10 parts; or Thymol, 2 parts, petroleum oil, 36 parts. Apply 4 or 5 times, drying between each. Use four or five days.

SOAP.

Soap can be prepared by various processes and with different shapes of dies.

I.

| | |
|------------------|-------------------|
| Soda ash | $\frac{1}{2}$ oz. |
| Calcium chloride | $\frac{1}{4}$ oz. |
| Barium sulphide | 1 oz. |
| Mahua oil | 1 dr. 20 mi. |
| Cresol | 1 dr. |

PROCEDURE:—Mix up the first two ingredients in an aluminium or strong earthen pan

with gentle agitation into mahua oil. Place the whole upon a strong furnace for at least one hour and a half. Keep vigilant watch so that the process of solidification may not be carried too far. Take the pan down from the hearth and during the process of cooling down add cresol and barium sulphide (pure quantity) little by little, stirring vigorously all the while till it is transferred and moulded into suitable dice. The dice should be carefully cleansed and dried. This soap is very powerful, less odorous and actually has greater disinfecting property than any other basic substance while incorporated with soap.

Corrosive sublimate might as well be used on account of its excellent germicidal property. But due care has to be taken for its chemical use.

A gentle vapour bath is congenial and conducive to its efficacy and strength and preservation.

II.

| | |
|-----------------|-------------------|
| Washing soap | 1 oz. |
| White starch | $\frac{1}{2}$ oz. |
| Barium sulphide | 1 oz. |

PROCEDURE:—Treat all the above together in a stone mortar and intimately put them into the dice as required.

III.

| | |
|--------------------------|------------|
| Glycerine | 453 parts |
| Coconut oil | 907 parts |
| Castor oil | 1844 parts |
| Caustic potash lye (33%) | 18.14 part |
| Starch | 113 parts |
| Sodium sulpho-hydrate | 907 parts |
| Citronella oil | 113 parts |

PROCEDURE:—First of all the glycerine, fat (coconut oil) and castor oil are saponified with 33 per cent. caustic potash lye; the soap is then filled with starch and sulpho-hydrate of sodium, and perfumed with citronella oil.

STICK AND PLASTER.

Soaps can conveniently be made into sticks. Owing to the presence of a small percentage of moisture, which can be ill evaded, it is more economic and cautious to form sticks of the powder by the help of a pressing stick dice specially manufactured for the purpose.

The end of the stick is dipped in water for use; directly after use the moisture has to

be sucked up by powdered carbonate of magnesium.

PLASTER.

These are made from colophony with 10 per cent. of yellow wax. These are heated like a stick of sealing wax until soft semi-fluid and lightly applied to the place from which the hair is to be removed and the mass is allowed to cool. The whole is then scraped off.

TAMBUL BILAS.

BY Tambul Bilas and similar other names are denoted a class of preparations which are used as concomitants with betel leaves—the universal masticatory of the Indian people. A wide range of spices enters into its composition and it is put into tin pots in the form of paste. It is used to disguise the bad odour of mouth and for scenting the breath imparting a pleasant feeling. It is taken at the end of a tooth-pick and is akin to Sen Sen, Zintan and similar preparations.

TAMBUL SHOVANA.

| | |
|-------------------------|---------|
| Pollen of Keora | 1 ch. |
| Nutmeg | 1 tola. |
| Seeds of Cardamom Minor | 1 ch. |
| Keora Water | q. s. |
| Sandal Otto | 30 min. |

PROCEDURE:—Macerate pollen, nutmeg and cardamom together in a mortar and pestle with *keora* water to form a paste. Perfume it with *otto* and pack in a tin pot.

MONMOHINI. ✓

| | |
|-------------------------|-------------------|
| Rose petals | 1 ch. |
| Seeds of cardamom major | $\frac{1}{2}$ ch. |
| Seeds of cardamom minor | $\frac{1}{2}$ ch. |
| Chua | 1 tola. |
| Rose Water | q.s. |

PROCEDURE:—Select fresh petals of red rose. Macerate these together with cardamom seeds in a stone mortar with rose water. Mix *chua* with the paste.

KASHMIRI KESAR. ✓

| | |
|-------------------------|---------------------|
| Saffron | 1 tola. |
| Seeds of cardamom minor | 2 tola. |
| Cloves | 4 as. |
| Pollen of keora | $\frac{1}{2}$ tola. |
| Musk | 1 as. |
| Keora water | q. s. |
| Chua | 1 tola. |

PROCEDURE:—Mix together the solid ingredients and macerate the mixture with *keora* water to form a paste. Lastly incorporate *chua* with the paste and put in gallipots.

NEPALI KASTURI. /

| | |
|-------------------------|--------------------|
| Saffron | $\frac{1}{2}$ tola |
| Seeds of cardamom major | 2 tola |
| Nutmeg | $\frac{1}{2}$ tola |
| Liquorice powder | 1 tola |

| | |
|-----------------|--------|
| Pollen of keora | 1 tola |
| Musk | 2 as. |

PROCEDURE:—Macerate the solid ingredients with *keora* water in a stone mortar and store in gallipots.

This should not be used more than 7 to 8 times a day. It is very heat-producing and can be resorted to in the winter season

TAMBULAMRIT.

| | |
|-------------------------|--------------------|
| Cloves | 1 tola |
| Seeds of cardamom minor | 2 tola |
| Cinnamon | $\frac{1}{2}$ tola |
| Rose water | q. s. |
| Chua | 1 ch. |

PROCEDURE:—Macerate the solid ingredients in a stone mortar with rose water to a paste. Mix into this paste *chua* and store in gallipots.

MONORANJAN.

| | |
|-------------------------|-------------------|
| Liquorice powder | $\frac{1}{2}$ ch. |
| Pollen of keora | $\frac{1}{2}$ ch. |
| Seeds of cardamom major | 1 tola |
| Seeds of cardamom minor | 1 tola |
| Cloves | 1 tola |
| Cinnamon | 1 tola |
| Saffron | 1 tola |

PROCEDURE:—Mix the ingredients excepting saffron and macerate together in a stone mortar with the requisite quantity of rose water. Then pulverise saffron finely and mix with the above paste and put in gallipots.

PAN BILAS.

| | |
|-------------------------|--------|
| Coriander seed | 1 tola |
| Aniseed | 1 tola |
| Parsley | 1 tola |
| Nutmeg | 1 tola |
| Ajawan | 1 tola |
| Saffron | 1 tola |
| Seeds of cardamom major | 1 tola |
| Seeds of cardamom minor | 1 tola |
| Cloves | 1 tola |
| Dry rose petals | 1 tola |
| Chua | 1 tola |
| Camphor | 1 tola |

PROCEDURE:—Take one tola each of the ingredients excepting the last two and soak them in good rose water for 12 hours. Then bray them together to a paste form and incorporate *chua* and camphor.

SEN SEN.

| | |
|------------------|-------------------|
| Ext. Glybriza | 1 oz. |
| Fine sugar | $\frac{1}{2}$ oz. |
| Menthol crystals | 5 grs. |
| Otto of rose | q. s. |

PROCEDURE:—Grind Ext. glybriza into very fine powder, then mix it with sugar and finally add menthol crystals and make into small globules of desired size. Ottos of rose and musk are to be taken in quantities according to taste. This a good tonic for hoarse voice.

For coating small quantities of pills with sugar, the following process may be adopted. Moisten the pills slightly but evenly with

| | |
|-----------------------|----------|
| Sandarac pill varnish | 1 part |
| Mucilage of acacia | 2 parts. |
| Simple syrup | 4 parts. |

and throw into a covered pot containing a mixture of finely powdered sugar seven parts, starch one part. Rotate rapidly for a few seconds, and turn out on to a hair sieve; separate the powder and rotate greatly on sieve until excess of powder has been rubbed off. Now place in another clean warm pot and rotate until perfectly dry. Repeat the operations until the pills have acquired three or four coatings, when they may be left on the sieve to dry.

HAIR DYES.

THE basis of nearly all hair dyes is either lead or silver, and the constant application of these metals to the skin is dangerous. We give here several such dyes with a silver basis but their use should be practised with the utmost care. To these we have added some which are innoxious, although these latter are not so effective as those prepared from silver and lead. It should be mentioned here that no hair dye produces a durable coloration; the colour becomes gradually weaker in course of time.

Finally we give a number of recipes culled from the Indian Pharmacopœia which will make grey hair permanently black on repeated application. But the difficulty with them is that they require a fairly long period of time during which the application should be made.

BLACK LIQUID HAIR DYE.

A few recipes with silver nitrate as basis follows:—

I.

- | | | |
|----|------------------------------|--------|
| A. | Nitrate of silver (crystals) | 1½ oz. |
| | Distilled water | 12 oz. |
| | Ammonia water | q. s. |
| B. | Pyrogalllic acid | 2 dr. |
| | Gallic acid | 2 or. |
| | Cologne water | 2 oz. |
| | Distilled water | 4 oz. |

PROCEDURE:—Dissolve in a bottle the nitrate of silver in the distilled water and add ammonia water until the precipitate is redissolved; in a second bottle mix the ingredients quoted in B. Pack separately. Apply the solution one by one with separate brushes.

II

- | | |
|-------------------|------------|
| Nitrate of copper | 360 grains |
| Nitrate of silver | 7 oz. |
| Distilled water | 60 oz. |
| Ammonia water | q. s. |

PROCEDURE:—Dissolve the salts in the water and add ammonia water carefully until the precipitate is all redissolved. This solution, if properly applied, produces a deep black colour. Copper sulphate may be used instead of the copper nitrate.

III.

- | | | |
|----|------------------|-----------|
| A. | Pyrogalllic acid | 25 grains |
| | Alkanet | 4¾ grains |

| | | |
|----|-------------------|-----------------------|
| | Methylated spirit | 6 fl. dr. |
| | Water | 1 fl. oz. |
| B. | Nitrate of silver | $\frac{1}{8}$ oz. |
| | Ammonia water | 1 fl. dr. |
| | Gum arabic | $\frac{3}{4}$ fl. dr. |
| | Distilled water | 7 fl. dr. |
| C. | Sodium sulphide | $7\frac{3}{4}$ grains |
| | Water | 2 fl. dr. |

PROCEDURE:—Make the three solutions separately and pack in three elegant bottles. If properly prepared the solution (A) will be a clear fluid, the solution (B) will be thick, brown and opaque while the last will act as a fixative. Apply with separate brushes.

IV.

| | |
|----------------------|----------|
| Bismuth nitrate | 10 parts |
| Glycerine | 150 „ |
| Caustic potash lye | q. s. |
| Citric acid | q. s. |
| Orange blossom water | q. s. |

PROCEDURE:—Place 10 parts of basic nitrate of bismuth and 150 parts of glycerine in a glass vessel, heat it gently and add caustic potash lye until by shaking, gentle heating, and digesting on a water-bath a solution as clear as water is obtained. Then add citric acid dissolved in an equal quantity of water

until the alkaline reaction only slightly prevails. Then add sufficient orange blossom water until the whole amounts to 300 parts. The fluid may now be compounded with some aniline colour. This preparation gives good result.

IV.

| | |
|-----------------------|----------|
| (A) Powdered gallnuts | 8 grm. |
| Water | 10 " |
| Rose water | 10 " |
| (B) Silver nitrate | 3 grm. |
| Water | 10 c. c. |

PROCEDURE:—Boil the gallnuts with the water. Strain the decoction through close cloth. Mix the rose water. Bottle the solution while still hot. The bottles may be of clear glass. In a separate vessel mix the two. Add sufficient ammonia to redissolve the precipitate formed in the above. Put in a dark bottle.

V.

| | |
|------------------------------------|------------|
| (A) Pyrogalllic acid | 1 dr. |
| Alcohol | 4 dr. |
| Distilled water | 4 fl. oz. |
| (B) Silver nitrate | 1 dr. |
| Ammonia water | q. s. |
| Distilled water, enough to make | 10 fl. oz. |

PROCEDURE:—Dissolve the silver nitrate in 4 fl. oz. of distilled water and then gradually add water of ammonia, stirring constantly, until the brown turbidity produced is vanished and the liquid is colourless. Then add enough distilled water to make 10 fl. oz. Excess of ammonia must be avoided as that produces brownish tint. The hair must have been cleaned with sodium carbonate or common washing soda and hot water, and dried. Solution (A) is first applied, and then, while yet moist, solution (B), being careful not to stain the skin.

BROWN HAIR DYE.

| | |
|------------------------|----------|
| (A) Nitrate of silver | 33 parts |
| Rose water | 250 " |
| (B) Potassium sulphide | 33 " |
| Water | 250 " |

PROCEDURE:—Dissolve the nitrate of silver in rose water and filter the solution. The mordant used with this preparation consists of a solution of sulphide of potassium in water. The mordant is first applied and, when dry, the solution of nitrate of silver. The hair should be previously washed with soap and dried.

HAIR DYE-POWDER.

I

| | |
|---------------------|----------|
| Litharge | 1 part. |
| Freshly slaked lime | 2 parts. |
| Starch | 2 parts. |

PROCEDURE:—Make very fine powders and dry perfectly; mix and keep the compound in well-corked bottles. This powder is to be made into a thin paste or cream with water and applied to the hair (previously freed from oils with soap and water, and dried), by means of a sponge or brush, or the fingers; continue rubbing it well into the roots, and to pass a comb for some time through it, occasionally adding a few drops of hot water to preserve the whole moist. Now conclude by washing with soap and hot water solution.

II

PROCEDURE:—Take of pure levigated litharge, dry fresh-slaked lime and prepared chalk in equal parts; mix thoroughly, pass the whole through a sieve and keep the mixed powder from the air in a well-corked bottle. Powdered starch may be substituted for the chalk prescribed. This is the most harmless of the

common dyes prepared of lime and litharge, but its action is somewhat delayed. Apply as a paste with water.

INNOXIOUS HAIR DYE.

PROCEDURE:—Pulverised gall-nuts are rubbed to a paste with sufficient fat oil and the paste is then roasted in an iron vessel until to more oily vapours escape. The residue is rubbed to a paste with water and while yet moist is mixed as intimately as possible, with sufficient metallic power, consisting of the finest iron and copper dust, as to retain the consistency of an ointment, and perfumed with powdered ambergris. The preparation must be kept in a moist place, as thereby only it acquires the property of dyeing the hair black. One application is sufficient to impart a beautiful black to the hair, which it retains for a long time, leaving it soft and glossy.

HAIR DYE POMADE.

| | |
|-------------------|---------|
| Nitrate of silver | 1 part |
| Nitric acid | 2 parts |
| Iron fillings | 2 " |
| Lard | 3 " |
| Oatmeal | 1 part |

PROCEDURE:—Nitrate of silver 1 part, nitric acid 2 parts, iron filings 2 parts. Mix, and let them stand together for 4 or 5 hours, then pour on them oatmeal 1 part. Next add lard 3 parts, and mix well together.

II.

| | |
|------------|---------|
| Lard | 5 parts |
| White wax | 2 „ |
| Bone black | 2 „ |

PROCEDURE:—Melting the first two ingredients together, and mix with them by 2 parts of bone-black. The dye is not a very durable one, but it is entirely harmless, and if carefully applied does not rub off as easily as might be supposed.

INDIAN VEGETABLE HAIR DYES.

I.

Mix equal parts of chalk and soap and half the quantity of lime; rub in a leaden pestle and mortar until the mixture acquires a bluish colour; apply this to the hair, rubbing in; tie up the hair within a cloth for about an hour; wash; thereafter apply a paste, which has been allowed to ferment to some extent, made of wheat flour, pulverised iron filings,

and yeast; tie again for another hour; wash in a strong infusion of galls or of *amla* (the emblic myrobalan) the latter being cheaper; thereafter apply an oil to give a gloss. The colour thus obtained is very black and perfectly fixed, being rendered useless only by the growth of the hair below which reveals the original colour.

II.

| | |
|-----------------------------|-------------------|
| Black tea | 2 oz. |
| Glycerine | 3 oz. |
| Tincture of cantharides | $\frac{1}{2}$ oz. |
| Bay rum | 1 quart |
| Essence of rose or bergamot | q. s. |

PROCEDURE:—Infuse black tea, two ounces, in one gallon of boiling water; strain and add three ounces of glycerine, half an ounce of tincture of cantharides, and one quart of bay rum. Digest this mixture for a couple of days, and perfume with essence of rose or bergamot or any other favourite essence to suit the taste.

PERMANENT HAIR DYE.

I

Bray *nilotpala* flowers to a paste with milk and bury it in the ground for one month.

After that period it is used as a hair dye. The grey hair will turn black even if it is applied twice a week.

II.

| | |
|------------------------|-------------------|
| Emblic myrobalan | 1 sr. |
| Sesamum oil | 5 srs. |
| Emblic myrobalan juice | 4 srs. |
| Bhimraj juice | 4 srs. |
| Fine iron dust | $\frac{1}{2}$ sr. |

PROCEDURE:—Put these ingredients in an iron pan and place in the sun for three months. Then apply on the hair daily.

III

PROCEDURE:—Procure the following ingredients: roots of white akand 2 ch.; pounded myrobalan 2 ch.; scraping of iron rust 4 ch. Boil them in $2\frac{1}{2}$ srs. of water. When the colour has turned deep and only half seer is left, remove and strain. Add 1 ch. powdered ferrous sulphate and store away in an iron pan for 20 days. Mix a little in the hair oil used and apply on the hair.

IV.

| | |
|--------------------|-------|
| Emblic myrobalan | 1 sr. |
| Belleric myrobalan | 1 sr. |

| | |
|------------------------|-------------------|
| Emblie myrobalan juice | 16 srs. |
| Bhimraj juice | 4 srs. |
| Nilotpala | 4 ch. |
| Kernel of mango stones | 1 sr. |
| Indigo wood | 1 sr. |
| Caps of marking nut | 4 ch. |
| Ferrous sulphate | $\frac{1}{2}$ sr. |
| Iron filings | 1 sr. |
| Blackberry | 1 sr. |
| Surma | 4 ch. |
| Lodhwood | $\frac{1}{2}$ sr. |
| Kesutya | $\frac{1}{2}$ sr. |
| Oil of black sesamum | 5 srs. |

PROCEDURE:—Put all these ingredients in an iron pan; place in the sun three months. Strain. Apply the decoction to the hair.

V

The three myrobalans each 1 ch.; iron dust 1 ch.; Bhimraj juice 4 ch. Bring these ingredients together in an iron slab. Then mix a quantity of sheep's urine and apply to the hair.

MANUFACTURE OF DENTRIFICES.

DENTAL preparations are greatly in request among all classes of people to keep the teeth clean and white. They not only prevent decay of teeth by virtue of mere cleanliness, but also help in removing decomposing particles of food and tend to keep the breath sweet and wholesome.

ESSENTIAL OF A TOOTH POWDER.

The properties of a tooth powder are cleansing power unaccompanied by any abrasing or chemical action on the teeth themselves, a certain amount of antiseptic power to enable it to deal with particles of stale food, and a complete absence of any disagreeable taste or smell. These conditions are easy to realise in practice, and there is a very large number of efficient and good powders, as well as not a few which are apt to injure the teeth if care is not taken to rinse out the mouth very thoroughly after using. The composition should be perfectly free from grits.

THE INGREDIENTS.

A perfect tooth powder that will clean the teeth and mouth with thoroughness need contain but few ingredients and is easily made. For the base there is nothing better than precipitated chalk; it possesses all the detergent and polishing properties necessary for the thorough cleansing of the teeth, and it is too soft to do any injury to soft or to defective or thinly enamelled teeth.

Next in value comes soap. Powdered white castile soap is usually an ingredient of tooth powders. There is nothing so effective for removing sordes or thickened mucus from the gums or mouth. But used alone or in too large proportions, the taste is unpleasant. Orris possesses no cleansing properties, but is used for its flavour and because it is most effective for masking the taste of the soap. Sugar or saccharine may be used for sweetening, and for flavouring almost anything can be used. Flavours should, in the main, be used singly as mixed flavours lack the clean taste of simple flavours. Various antiseptic agents may be added if necessary.

PRECIPITATED CHALK.

Precipitated chalk makes an excellent basis in making tooth pastes and powders. The method of its preparation may here be given below:

When a solution of sodium carbonate is added to another solution of calcium chloride, a copious white precipitate of calcium carbonate (which is a chemical name for chalk) is formed with the separation of sodium chloride (common salt). To separate the chalk from common salt which may adhere to the precipitate it is to be washed well and then dried.

In practice dissolve 5 oz. of calcium chloride in 2 pints of boiling distilled water and 13 oz. of sodium carbonate in 2 pints of boiling distilled water. Mix the two solutions (both cold) and allow the precipitate to subside. Collect this on a calico filter, wash it with boiling distilled water until the washing ceases to give a precipitate with nitrate of silver which provides the test for the non-presence of sodium chloride.

For ordinary purposes distilled water may be replaced by filtered water and the object
PR. I. 5

of washing should be to carry off all adhering sodium chloride from the precipitate.

PREPARED CHALK.

Precipitated chalk is the purest form of calcium carbonate and is used in the first class preparations. In other cases the prepared chalk may be used without much prejudice.

Prepared chalk is prepared by choosing the very finest white chalk, grinding it to a very fine powder with water, then mixing with water and allowing it to flow slowly through several tanks; the chalk precipitated in the tanks is of increasing fineness, according to the length of time that it remains in suspension, that which deposits in the last vat being the finest. After a sufficient quantity of chalk has deposited the water is drained off and the chalk is slowly dried in a heated room.

THE VARIETIES.

Dental preparations may be broadly classified under tooth powder and tooth cream. They should be aromatic, pleasantly smooth and should be absolutely free from all grits. The powder is packed in tin boxes or cylindrical containers with narrow apertures at

the top to let out small quantities of powder at a time and the mouth capable of being closed when desired. The cream should be in the form of a paste and packed in collapsible tubes. The paste should come out in the shape of an unbroken thread when the bottom of the tube is pressed between the fingers.

TOOTH POWDER.

A few recipes of making tooth powder are given below.

I.

| | |
|------------------------------------|---------------------|
| Precipitated chalk | 1 pound |
| White castile soap | 1 ounce |
| Orris | 2 ounces |
| Sugar (or saccharine, 2 grains) | 1 ounce |
| Oil of wintergreen | $\frac{1}{4}$ ounce |

PROCEDURE:—The first four ingredients should be in the finest possible powder and well dried. Triturate the oil of wintergreen with part of the chalk, and mix this with the balance of the chalk. Sift each ingredient separately \times through a sieve (No. 80 or finer), and mix well together, afterwards sifting the mixture 5 or 6 times. The finer the sieve and the more the

mixture is sifted, the finer and lighter the powder will be.

This gives a white, saponaceous, winter-green-flavoured powder.

II.

| | |
|--------------------|-----------|
| Precipitated chalk | 1 pound |
| Orris | 2 ounces |
| Sugar | 1½ ounces |
| White castile soap | 1 ounce |
| No. 40 carmine | 15 grains |
| Oil of rose | 12 drops |
| Oil of cloves | 4 drops |
| Ammonia | q. s. |

PROCEDURE:—Dissolve the carmine in an ounce of water of ammonia and triturate this with a part of the chalk until the chalk is uniformly dyed. Then spread it in a thin layer on a sheet of paper and allow the ammonia to evaporate. When there is no ammoniacal odour left, mix this dyed chalk with the rest of the chalk and sift the whole several times until thoroughly mixed. Then proceed to make up the powder as in the previous formula, first sifting each ingredient separately and then together, being careful thoroughly to triturate the oils of rose and

cloves with the orris after it is sifted and before it is added to the other powders. The oil of cloves is used to back up the oil of rose. It strengthens and accentuates the rose odour. Be careful not to get a drop too much, or it will predominate over the rose.

III.

| | |
|---------------------------|-----------|
| Precipitated chalk | 1 pound |
| Orris | 4 ounces |
| Castile soap | 1 ounce |
| Sugar | 1½ ounces |
| Extract of violet | ½ ounce |
| Evergreen colouring R & F | q. s. |

PROCEDURE:—Proceed as in the second formula, dyeing the chalk with the evergreen colouring to the desired shade before mixing. This gives violet tooth powder.

IV.

| | |
|--------------------|-----------|
| Precipitated chalk | 1 pound |
| Castile soap | 5 drachms |
| Borax | 3 drachms |
| Thymol | 20 grains |
| Menthol | 20 grains |
| Eucalyptol | 20 grains |
| Oil of wintergreen | 20 grains |
| Alcohol | ½ ounce |

PROCEDURE:—Dissolve the thymol and oils in the alcohol, and triturate with the chalk, and proceed as in the first formula.

One fault with this powder is the disagreeable taste of the thymol. This may be omitted and the oil of wintergreen increased to the improvement of the taste, but with some loss of antiseptic power.

V.

| | |
|---------------------|---------|
| Menthol | 1 part |
| Salol | 8 parts |
| Soap, grated fine | 20 „ |
| Precipitated chalk | 20 „ |
| Magnesium carbonate | 60 „ |
| Oil of mint | 2 „ |
| Pumice | q. s. |

PROCEDURE:—Powder finely and mix. If there is much tartar on the teeth it will be well to add to this formula from 10 to 20 parts of pumice, powdered very finely.

VI.

| | |
|----------------------------|-----------|
| Camphor | 0.5 parts |
| Soap | 1 „ |
| Saccharine | 0.025 „ |
| Prepared chalk | 50 „ |
| Oil of sassafras or cassia | q. s. |

PROCEDURE:—Powder finely and mix. Oil of sassafras, or cassia may be added enough to perfume.

VII.

| | | |
|-----------------------|-------|-------|
| Cream of tartar | 1,000 | parts |
| Alum | 190 | " |
| Carbonate of magnesia | 375 | " |
| Sugar | 375 | " |
| Cochineal | 75 | " |
| Essence cinnamon | 90 | " |
| Essence cloves | 75 | " |
| Essence peppermint | 45 | " |

PROCEDURE:—Powder finely and mix.

VIII.

| | | |
|---------------------|-----|--------|
| Sugar | 200 | parts. |
| Cream of tartar | 400 | " |
| Magnesia | 400 | " |
| Starch | 400 | " |
| Cinnamon | 32 | " |
| Mace | 11 | " |
| Sulphate of quinine | 16 | " |
| Carminc | 17 | " |

PROCEDURE:—Powder finely and mix.

IX.

| | | |
|-----------------|-----|-------|
| Cream of tartar | 150 | parts |
| Alum | 25 | " |
| Cochineal | 12 | " |
| Cloves | 25 | " |

| | |
|-----------------|----------|
| Cinnamon | 25 parts |
| Rosewood | 6 " |
| Essence of rose | q. s. |

PROCEDURE:—Powder finely and mix.

X.

| | |
|------------|----------|
| Borax | 50 parts |
| Chalk | 100 " |
| Myrrh | 25 " |
| Orris root | 22 " |
| Cinnamon | 25 " |

PROCEDURE:—Powder finely and mix.

XI.

| | |
|---------------------|---------|
| Orris | 6 parts |
| Magnesium carbonate | 2 " |
| Almond soap | 12 " |
| Prepared chalk | 60 " |
| Thymol | 1 part |
| Alcohol | q. s. |
| Essential oils | q. s. |

PROCEDURE:—Powder the solids and mix. Dissolve the thymol in as little alcohol as possible, and add perfume in a mixture in equal parts of oil of peppermint, oil of clove, oil of lemon, and oil of eucalyptus. About 1 minim of each to every ounce of powder will be sufficient.

XII.

| | | |
|------------------------------------|-----|-------|
| Potassium chlorate | 200 | parts |
| Starch | 200 | " |
| Carmin lake | 40 | " |
| Sachharine (in alcoholic solution) | 1 | part |
| Vanillin (dissolved in alcohol) | 1 | " |
| PROCEDURE:—Powder finely and mix. | | |

XIII.

| | | |
|----------------------------|------|-------|
| Prepared corals | 120 | parts |
| Venetian red | 9 | " |
| Ochre | 15 | " |
| Pumice stone | 15 | " |
| Musk | 1/20 | " |
| PROCEDURE:—Powder and mix. | | |

XIV.

| | | |
|----------------------------|---|-------|
| Bole | 3 | parts |
| Chalk | 2 | " |
| Ochre | 1 | part |
| Pumice stone | 1 | " |
| Musk | | trace |
| PROCEDURE:—Powder and mix. | | |

XV.

| | | |
|-----------------------------------|----|-------|
| Prepared chalk | 30 | parts |
| Orris root | 20 | " |
| Castile soap | 2 | " |
| PROCEDURE:—Powder finely and mix. | | |

XVI.

| | |
|-----------------|----------|
| Sugar | 30 parts |
| Wood charcoal | 30 " |
| Peruvian bark | 15 " |
| Cream of tartar | 5 " |
| Cinnamon | 1.5 " |

PROCEDURE:—Powder as fine as possible and mix. This is known as Deschamp's Alkaline Tooth Powder.

XVII.

| | |
|--------------------|-----------|
| Talc | 120 parts |
| Sodium bicarbonate | 30 " |
| Carminc | 2/10 " |
| Oil of mint | 15 drops |

PROCEDURE:—Powder and mix the first three ingredients and then add oil of mint. This is known as Deschamp's Acid Tooth Powder.

XVIII.

| | |
|---------------|-----------|
| Charcoal | 120 parts |
| Peruvian bark | 120 " |
| Cloves | 2 " |

PROCEDURE:—Powder and mix.

XIX.

| | |
|--------------------|---------------------|
| Sodium salicylate | 2 $\frac{3}{4}$ dr. |
| Sugar of milk | 11 $\frac{1}{4}$ " |
| Sodium bicarbonate | 11 $\frac{1}{4}$ " |

| | |
|-------------------|----------|
| Orris root | 11½ dr. |
| Red sanders root | 11½ „ |
| Oil of peppermint | 15 mins. |

PROCEDURE:—Powder finely and mix.

CARBOLIC TOOTH POWDER.

| | |
|--------------------|----------|
| Precipitated chalk | 3000 gr. |
| Lactose | 2000 „ |
| Cream of tartar | 1300 „ |
| Oil of rose | 2 „ |
| Oil of geranium | 15 „ |
| Carbolic acid | 80 „ |

PROCEDURE:—Mix the ingredients thoroughly.

ANTISEPTIC TOOTH POWDER.

| | |
|---------------------|---------|
| Strontium carbonate | 150 gr. |
| Chalk (prepared) | 375 „ |
| Magnesia (Calcined) | 375 „ |
| Salol | 90 „ |
| Thymol | 15 gr. |
| Carmin solution | q. s. |
| Oil of peppermint | q. s. |

PROCEDURE:—Mix the ingredients thoroughly.

✓ MEDICINAL TOOTH POWDER.

| | |
|---------------|-----------|
| Sanders wood | 200 parts |
| Peruvian bark | 25 „ |
| Oil of cloves | 1 pa |

| | |
|------------------|-------|
| Chloroform water | q. s. |
| Carmin solution | q. s. |

PROCEDURE:—Proceed as above adding chloroform water to cause liquefaction and carmine solution to colour.

. IV.

| | |
|--------------------|-----------|
| Precipitated chalk | 160 grs. |
| Soap powder | 45 " |
| Wheat starch | 45 " |
| Carmin | 1 gr. |
| Oil of peppermint | 30 minims |
| Oil of geranium | 30 " |
| Oil of eucalyptus | 60 " |
| Oil of cloves | 12 " |
| Oil of aniseed | 12 " |
| Glycerine | q. s. |
| Alcohol | q. s. |

PROCEDURE :—Incorporate thoroughly. Make into paste by adding glycerine and alcohol in equal parts. Put in collapsible tubes.

V.

| | |
|-----------------------|----------------------|
| Sodium salicylate | 2 $\frac{3}{4}$ dr. |
| Sodium bicarbonate | 30 grs. |
| Powdered talc | 1 $\frac{1}{2}$ oz. |
| Powdered castile soap | 1 $\frac{1}{2}$ oz. |
| Carmin | 4 $\frac{1}{2}$ grs. |
| Peppermint | 20 minims |

| | |
|------------------------|--------|
| Glycerine | 5½ dr. |
| Diluted spirit of wine | 5¼ dr. |

PROCEDURE:—Incorporate intimately.

VI.

| | |
|----------------|------------|
| Salicylic acid | 30 grains. |
| Purified honey | 1 oz. |

PROCEDURE:—Make into a paste. This makes a good antiseptic mouth paste.

VII.

| | |
|------------------------|--------|
| Formalin | 30 gr. |
| Levigated chalk | 1000 " |
| Violet root (powdered) | 200 " |
| Magnesium carbonate | 50 " |
| Soap powder | 100 " |
| Peppermint oil | 10 " |
| Bergamot oil | 2 " |
| Citronella oil | 1 " |
| Glycerine | 100 " |

PROCEDURE:—Triturate the formalin with chalk and add the rest one by one. The whole is mixed up to form a paste with chemically pure glycerine.

VIII.

| | |
|---------------------|-----------|
| Thymol | 0.05 gram |
| Extract of krameria | 1 " |
| Glycerin | 10 " |
| Light magnesia | 0.5 " |

| | |
|-------------------|----------|
| Borax | 4 grams |
| Oil of peppermint | 20 drops |
| Hard soap | 30 grams |

PROCEDURE:—As above.

THYMOL TOOTH PASTE.

| | |
|---------------------|-----------------------|
| Precipitated chalk | 16 av. oz. |
| Magnesium carbonate | $\frac{3}{4}$ av. oz. |
| Orris root (powder) | 3 av. oz. |
| Thymol | 60 grains. |
| Gelatine (pure) | 70 grains |
| Glycerine | 3 fl. oz. |
| Water | 1 fl. oz. |

PROCEDURE:—Mix the first four ingredients well and make a mixture of the rest dissolving the ingredients by the application of gentle heat. Finally incorporate the two mixtures.

MANUFACTURE OF CRAYONS.

THE basis of all crayons or writing pencils is carbonate of lime as it occurs in nature or natural chalk. But as it is unsuitable for direct use it is first ground to powder and levigated. The levigated chalk is worked in a kneading machine, with an addition of kaolin or pipe clay and an adhesive, such as gum arabic and tragacanth, and the resulting mass is pressed several times in spindle processes. It is then forced through a suitable nozzle by means of a worm press. The rod of pencil which issues is cut into suitable lengths. The pieces are finally dried at about 100°F. The proportion of kaolin and gum to be added depends upon the quality of the chalk and should be determined by experience, the results aimed at being "binding material" and "covering power." The pencil should also leave good marks.

COLOURED CRAYONS.

Coloured crayons are made of kaolin, chalk, amorphous pigments and a binding
Pr. I. 6.

medium. The method is similar to the above. In the preparation of these pencils of any colour or shade suitable pigments are employed which are diluted with a proper quantity of prepared chalk which should not only be powdered finely but should possess no grit at all.

For example, black crayons are made of prepared black lead, ivory-black, and lamp-black, etc. Red crayons have as their colouring ingredients, carmine, carminated lakes, vermillion, and any of the earthy or mineral colours commonly used as pigments. Blue crayons are made of indigo, smalts, Prussian blue, etc.; green crayons, of a mixture of chrome yellow, or yellow ochre with blues; yellow crayons, of chrome yellow, Naples yellow, yellow ochre, etc.; brown crayons, of raw and burnt amber or sienna, brown ochre, etc. Purple crayons are made with any of the more brilliant blues, mixed with carmine, lake or vermillion.

Various delicate shades of colour may be obtained by mixing black or carmine with any of the above colours or by intermixing.

MANUFACTURE OF CRAYONS.

It would appear from the above that the manufacture of crayons involves three stages; (1) preparation of the base, (2) preparation of the colour, and (3) mixing of the two. A white paste serves as a base even for the black crayons, the required quality and quantity of the colour being added to it.

PREPARATION OF BASES

It is very important that the white chalk or pipe-clay used as basis should be without grit. To prepare this put the whiting into a large vessel of water. Mix thoroughly. Pour off the top into another vessel. Throw away the gritty sediment. This operation is to be repeated several times. Having done this allow the whiting to settle. Pour the water from it and dry it for use. Prepared chalk (*page 66*) may be used as well.

RECIPES.

A few general methods of preparing the base follow:—

(1) Make up a paste mixing equal parts of washed pipe-clay and washed chalk (whit-

ing) with hot beer to which is dissolved one or two chips of isinglass.

(2) Prepare very strong soap suds by dissolving 2 oz. of white soap shavings in a pint of water over the fire. While hot, stir into the mixture powdered pipe-clay (common) till it becomes pasty. Before the powders are added, spirits of wine will render the soap water transparent.

(3) Make a solution of 3 oz. of spermaceti in a pint of water. Stir into it some thoroughly sifted (or washed) white colour to make up required consistency.

(4) Add 6 parts of pipe-clay and 1 part of oil of turpentine to a thick solution of 3 oz. of shellac in 2 oz. of methylated spirit. Grind them together thoroughly. It will be better to use shellac of lighter colour. Before adding the turpentine the requisite colours should be ground up with it.

(5) Into a pint of boiling water, add 1 oz. of curd soap in fine pieces. Allow to cool and make the solution transparent by adding sufficient methylated spirit. Make a paste with equal parts of china-clay and prepared chalk.

(6) Take 2 ounces of turpentine, 4 ounces of methylated spirit and 6 ounces of fine shellac. The clay must be well mixed with water, passed through a fine lawn sieve, and allowed to subside; the water is then poured off and the clay dried. The shellac must be dissolved in the mixed turpentine and spirits with a little warmth. The dry clay and the colouring, must be blended in a mortar, and then the shellac mixture added and well incorporated till the whole is a doughy mass.

COLOURING MATTER.

It should be borne in mind that the colour alters very much in drying and hence allowance must be made for that.

WHITE.

Use white or prepared chalk, pipe-clay, alum white, oyster shell white, calcined bones, etc.

BLACK.

(1) Only lamp black is to be added when white paste is employed.

(2) Grind with water to a stiff paste the following:—Pipe-clay 10, lamp black 3, Prussian blue $\frac{1}{8}$, by parts.

BLUE.

(1) Dissolve some Prussian blue in water. Put the solution in a hole in a piece of chalk. The water will be absorbed by the chalk and a large portion of the colour left for mixing. Thus the difficulty of grinding it will be avoided.

(2) Blue verditer is a good bright colour. But a thorough washing is required as it is very gritty.

(3) A mixture of pipe-clay and ultramarine will give nice result.

BROWN.

(1) Use Cologne earth. Treat as in the case of Blue.

(2) Use raw and burnt umber. Treat as in the case of Blue.

(3) Use raw and burnt sienna. Treat as in the case of Blue.

(4) Use Vandyke brown. Treat as in the case of Blue.

RED.

Grind well in water any of the colours, Vermillion, Red Lead, Red Ochre, Indian Red

and Venetian Red. Mix well with the white in different shades while wet. Salmon or flesh colour, or orange will be made thus. When the carmine and lake are employed first dissolve the colour in water or spirits of wine. Add this to almost dry white colour. Thoroughly grind the whole together.

YELLOW.

Naple's yellow, King's yellow, Yellow lake may be dissolved in spirits of wine and treated as the carmine. The various yellow ochres make good crayons.

GREEN.

(1) Simple colours may be used; as green carbonate of copper, etc.

(2) By adding compositions of the yellow and blue crayons together.

(3) Indigo or Prussian blue used in combination with raw and burnt sienna. Green crayons are more difficult to make.

COLOURS FOR CRAYONS.

A list of colours for crayons to be added to the white paste:—

WHITE: Zinc white, Paris white, Satin white.

BLUES: Ultramarine, Prussian blue, Cobalt blue.

BROWN: Vandyke brown, Raw and burnt Turkey umbers, Coppat and Cassel browns, Raw and burnt sienna.

BLACK: Lampblack, bone-black or ivory-black.

GREEN: Emerald green, chrome greens, zinc greens.

RED: Venetian red, Indian red, light red, red oxide, carmine, vermillion, madder red.

YELLOW: Cadmium yellow, zinc chrome, yellow ochre, raw sienna. By mixing suitable proportions of the above innumerable varieties of tints may be obtained.

Mixed or half-colours are produced by admixtures.

PURPLE: Blue and carmine.

ORANGE: Yellow and red.

SHADING: Black and carmine.

RICH BROWN: Vermillion and black.

OLIVE: Green and brown.

CHOCOLATE: Red and brown.

MIXING.

Grind together the prepared colouring matter and the base until they are uniformly mixed. The proportions must be suited to the desired tint.

To make the paste to form the crayons employ a mucilage of gum-arabic or gum tragacanth. Sometimes skimmed milk, barley water and powdered sugar candy are also used. Place the paste upon absorbent paper to remove superfluous moisture. Roll out into thin sheets over a smooth oily slab of marble and cut into slips. Roll these again into cylinders $2\frac{1}{2}$ inch long with the help of a flat piece of work. To prevent air-bubbles, subject to strong pressure or they may be pressed into wooden or metallic moulds, well oiled to prevent sticking and allowed to dry slowly at ordinary temperature or at a very gentle heat. They will be covered with a kind of bloom. Remove this by fine glass-paper, and the true colour will be revealed.

In case of more delicate colours force the composition through the nozzle of a tin funnel

instead of rolling them. Paint them when dry.

CRAYON FOR WRITING ON GLASS.

A suitable pencil for writing may be made according to the following recipe.

| | |
|--------------------------|-------|
| Spermaceti | 4 oz. |
| Tallow | 3 oz. |
| Beeswax | 2 oz. |
| Red lead, in fine powder | 6 oz. |
| Caustic potash | q. s. |

PROCEDURE:—Melt, mix, and while hot add boiling saturated solution of caustic potash 1 fl. oz. Keep warm for half an hour, stirring occasionally. Pour into moulds. The glass must be clean and dry.

INDUSTRIAL CEMENTS.

RUBBER solution, glass cement, etc. are widely employed in repairing leaks in rubber, broken glass, porcelain, chinaware, etc. These cements can be manufactured with a small capital.

RUBBER SOLUTION.

Carbon bisulphide is the solvent most commonly employed to prepare rubber solutions. Chloroform is also widely used for this purpose, but it is more expensive. Benzol, which is obtained by distilling petroleum is good and at the same time much cheaper but gasoline is probably most extensively used because of its cheapness. Plain rubber cement is prepared by adding any of the solvents to the crude rubber, originally cut into pieces. Rosin and shellac are often added to it to give it increased adhesive property.

MANIPULATIONS.

Great care should be exercised in the preparation of the solution to guard against

fire; they should not be prepared at night as all the solvents are very volatile and inflammable. Vessels which are used to digest the rubber should be closed and if possible put out of doors. If heat is required, use a sand or hot water bath; on no account bring near a fire.

Cut India rubber with a wet knife into the thinnest possible slices and with shears divide these into threads as fine as yarn. Put a small quantity of the shreds (say 1/10th. or less of the capacity of the bottle) into a wide-mouthed bottle and fill it three-quarters full with benzine of good quality, perfectly free from oil. The rubber will swell up almost immediately, and in a few days, especially if often shaken, assume the consistency of honey. If it incline to remain in undissolved portions, more benzine must be added; but if too thin and watery, the solution requires more rubber. A piece of solid rubber the size of a walnut will make a pint of the cement. This cement dries in a few minutes, and by using three coats in the usual manner will unite leather strops, rubber soles, patches, backs of books, etc. with exceeding firmness.

RECIPES.

A few recipes of making rubber cements are given here.

I.

Rubber, 100 parts; rosin 15 parts, shellac 10 parts, carbon bisulphide or any other previously mentioned solvent in a quantity quite sufficient to dissolve the articles added.

II.

Guttapercha, in pieces 1 oz.; carbon bisulphide 8 fl. oz.; rosin 40 grains. Mix and dissolve.

III.

Rough rubber, 20 parts; rosin 10 parts; Venetian red, 10 parts; tallow, 5 parts. Melt the rubber over a fire, then add the rosin and the tallow and lastly the red.

IV.

Macerate $\frac{1}{2}$ oz. crude rubber in 4 oz. carbon bisulphide for a day and then add a solution of 1 oz. rosin and $\frac{1}{4}$ oz. beeswax in 4 oz. carbon bisulphide.

V.

Melt together 2 oz. shellac and 2 oz. guttapercha. Also melt $\frac{1}{4}$ oz. red lead and $\frac{1}{4}$

oz. sulphur. Add the latter to the former stirring constantly.

VI.

Caoutchouc 2 oz., rosin 140 gr., shellac 100 gr. A sufficient quantity of carbon bisulphide should be employed to dissolve the ingredients. This preparation is to be used only white hot.

VII.

Isinglass $\frac{1}{2}$ oz., gutta-percha $\frac{1}{2}$ oz., caoutchouc 1 oz., carbon bisulphide 4 fl. oz. Mix and dissolve.

VIII.

Shellac 1 oz., guttapercha 1 oz., sulphur 45 gr., red lead 45 gr. Melt together the shellac and guttapercha, then add, with constant stirring, the sulphur and red lead. This is good for cementing rubber tubes on cycles, etc.

IX.

Caoutchouc 5 parts, chloroform 3 parts. Dissolve caoutchouc in chloroform and add gum mastic powder 1 part. This solution may be applied to cloth.

GLASS CEMENT

While using any glass cement the following method should be followed:—Both surfaces to be joined must be absolutely clean, free from dust, dirt, grease, etc. When the cement is one that requires the application of heat before use, the objects to be united should also be heated to a point at least as high as the melting point of the cement. Avoid using too much of the cement, for the thinner the layer of cement, the stronger the joint. Cover both surfaces to be united, coapt them exactly and press together as closely as possible. Bind the parts securely and let remain without loosening or attempting to use the article for 2 or 3 days or longer.

I.

A good cement for repairing broken glass is made by placing in a wide-mouthed bottle a small quantity of glue, just covering it with water, and allowing it to stand overnight; next day the excess of water is poured off and the glue is covered with methylated spirit. The bottle is then placed in a pan of water and heated until the glue is melted, then a

little whiting is shaken into it, the bottle removed from the pan, cooled and tightly corked. Sometimes a small piece of gum mastic, together with some gum ammoniacum is added to such cements. Place the bottle in hot water for a few minutes to soften it before use.

II.

Cover $\frac{1}{2}$ oz. of gelatine with strong acetic acid and, after standing, melt it down by placing the bottle in hot water. This cement is ready for use if it is placed for a few minutes in hot water.

III.

Coagulate milk with acetic acid and wash the casein in water. It is then dissolved in a cold saturated solution of borax, and a clear solution is obtained, which is mixed with finely powdered quick-lime. This should be applied to the broken parts quickly, and the whole bound tightly with cord and gently heated.

IV.

25 parts of isinglass are to be soaked in cold water over-night, till it has become swollen and soft throughout. Remove any super-

fluorous fluid and hang up the isinglass in some coarse cloth so that any free residual water will drain away. When thoroughly drained it is put into a flask or other container, placed in a water bath and heated carefully till it becomes fluid, taking care that it does not come to a boil. Digest 2 parts of gum ammoniacum and 1 part of gum mastic in 5 parts of 95 per cent alcohol and add the solution to the gelatine after removing the same from the water bath and letting it cool down to about 160°F. The whole is to be stirred briskly and agitated.

V.

Take alcohol 1000 parts, sandarac 60 parts, mastic 60 parts, turpentine oil 60 parts. Dissolve the gums in the alcohol and add the oil and stir in. Now prepare a solution of equal parts of glue and isinglass, by soaking 125 parts of each in cold water until it becomes saturated, pouring and pressing off the residue and melting on the water-bath. This will produce a volume of glue nearly equal to that of the solution of gums. The latter should, in the meantime, have been cautiously raised to PR. I. 7.

the boiling point on the water bath and then mixed with the hot glue solution. It is said that articles such as glass, stone ware, metal united with this substance will stand the strain of cold water for an unlimited time and it takes even hot water a long time to affect it.

VI.

Take pulverized glass, 10 parts; powdered fluorspar, 20 parts; soluble silicate of soda, 60 parts; both glass and fluorspar must be in the finest possible condition which is best done by shaking each in fine powder with water, allowing the coarser particles to deposit and then to pour off the remainder, which holds the finest particles in suspension. The mixture must be made very rapidly, by quick stirring, and when thoroughly mixed must be at once applied.

VII.

Dissolve one-eighth oz. of white glue in the smallest quantity of water possible; then add 2 ozs. of proof spirit and dissolve in it 10 gr. gum ammoniacum and 30 gr. of gum mastic. Mix carefully with the glue solution and when wanted for use immerse in hot water

until in a liquid condition. Apply to the edges of the broken material and unite carefully. This will bear an ordinary degree of warmth but is not likely to stand great heat.

VIII.

Finely pulverized caustic lime 10 parts; triturate with 25 parts of fresh egg albumen, add 10 parts of water, then mix with 50 parts of plaster of Paris and apply at once.

IX.

Iron fillings $13\frac{1}{4}$ lbs., cement $2\frac{1}{4}$ lbs., plaster of Paris 1 pound, sal-ammoniac $2\frac{1}{2}$ ounce, powdered sulphur $1\frac{3}{4}$ ounces, vinegar $1\frac{3}{4}$ pints.

Mix and stir the mass into a paste with water. The cemented articles must not be exposed to moisture. This is meant for glass retorts.

CEMENT FOR GLASS AND PORCELAIN.

I.

To make cement for mending glass or china without leaving black marks, mix up $1\frac{1}{2}$ oz. of gum sandarac, $1\frac{1}{2}$ oz. of white shellac, and $\frac{1}{2}$ pint of methylated spirit.

II.

Take elutriated glass powder 10 parts, elutriated powder of flourspar 20, solution of water glass 60. The ingredients are stirred together as quickly as possible and the resulting homogeneous paste is immediately applied. The cement becomes so hard in a few days that the cemented article can be safely heated.

III.

Take boiled linseed oil, 20 parts; Flemish glue, 20 parts, hydrated lime, 15 parts; powdered rosin, 5 parts; alum, 5 parts; acetic acid, 5 parts. Dissolve the glue in the acetic acid, add the alum, then the hydrated lime, and finally the rosin and the boiled linseed oil. Triturate all well until the whole forms a homogeneous paste. Keep in well closed flasks.

CEMENT FOR PORCELAIN.

There are many cements for repairing china and porcelain. For large articles, plaster of Paris may be stirred into a clear solution of gum arabic. This should be used immediately, but is useless if the vessel to be mended has to hold water.

I.

A cement which is said to stand both heat and water is made by calcining and grinding oyster shells. These are then reduced to the finest powder possible with a muller, and the whole is beaten into a paste with the white of an egg. In using this preparation the broken parts should be pressed well together.

II.

A sulphur paste for porcelain is made with sulphur, 7 parts; white pitch, 5 parts; bleached shellac, 1 part; glass meal, 7 parts; gum elemi, 2 parts; and mastic, 2 parts.

III.

A very strong solution for glass or porcelain may be obtained from casein dissolved in a soluble silicate of sodium or potassium.

IV.

A cement is made from isinglass, alcohol, strong gum ammoniacum powdered, and rectified spirit of wine. Soak 1 drm. of isinglass in water, and pour upon this enough alcohol to cover the mass, and allow the isinglass to

dissolve aiding the solution by placing the mixture in a warm place. Next dissolve $\frac{1}{2}$ drm. of mastic in 1 fluid drm. of rectified spirit of wine. Mix both solutions together, then put into the mixture $\frac{1}{2}$ drm. of powdered gum ammoniacum, and evaporate the mixture in a water bath until it has acquired the desired consistency. Put the cement in glass phials, and, when it is wanted for use, liquefy the cement by standing the phial in a cup of hot water, when the cement will become soft so that it can be conveniently applied to the fragments of porcelain to be cemented, which should be previously heated.

CASEIN CEMENTS.

Caseine can be used for preparing a number of cements. It is best to prepare an entirely pure casein, although that found in old cheese may be used; but this always contains some fat, salt, and free acids, which exert an injurious effect upon the hardness and solidity of the cement. Pure casein is prepared in the following manner: Milk, carefully skimmed so that not a trace of cream remains, is allowed to curdle by letting it

stand in a warm place. The curdled milk is then poured through a paper filter, and the casein remaining upon the filter is washed with rain water until the latter shows no trace of free acid. To remove the last traces of fat the casein is tied in a cloth and boiled in water. It is then spread out upon blotting paper and allowed to dry in a moderately warm place, when it will shrivel up to a horn-like mass. This pure casein, when properly dried, can be kept for a long time without injury. A few recipes with casein follow:—

I.

| | |
|-------------|-----------|
| Casein | 12 parts. |
| Slaked lime | 50 " |
| Fine sand | 50 " |

This cheap cement is well adapted for filling large holes in freestone and joints between building stones.

II.

Fresh cheese is boiled in water until it has been dissolved to a mass which will draw into threads between the fingers. Slaked lime and very finely-sifted wood ashes are then stirred into the solution. Take:

| | |
|-------------|------------|
| Cheese | 100 parts. |
| Water | 200 „ |
| Slaked lime | 25 „ |
| Wood ashes | 20 „ |

JEWELLER'S CEMENT.

| | |
|----------------|------------|
| Isinglass | 100 parts. |
| Mastic varnish | 50 „ |

The isinglass is dissolved in as small a quantity of water as possible, with the addition of some strong spirit of wine. The mastic varnish is prepared by pouring highly rectified spirit of wine and benzine over finely powdered mastic and dissolving this in as small a quantity of the solvent as possible. The two solutions are then poured into a porcelain dish and intimately worked together.

CEMENT FOR CELLULOID.

I.

Shellac 1 part is dissolved in spirits of camphor 1 part, with 3 to 4 parts strong alcohol. It is applied warm and the parts united must not be disturbed until the cement is hard.

II.

Another method is to make a mixture composed of 3 parts of alcohol and 4 parts of

ether. Keep this mixture in a well-corked bottle and when it is needed for use, the broken surfaces of celluloid articles are painted over with this mixture until the surfaces soften; then press together and bind and allow to dry for at least 24 hours.

III.

Dissolve 1 part of gum camphor in 4 parts of alcohol and dissolve an equal weight of shellac in such strong camphor solution. The cement is applied warm and the parts united must not be disturbed until the cement is hard.

GUTTAPERCHA CEMENT.

To make guttapercha cement, melt together in an iron pan 2 parts of common pitch and 1 of guttapercha; stir them well together until thoroughly incorporated, and then pour the liquid into cold water. When cold it is black, solid and elastic; but it softens with heat, and at 100°F. (38°C) is a thin fluid. It may be used as a soft paste, or in a liquid state in cementing metal, glass, porcelain, ivory, etc. Try this also for joining gramophone records.

ASBESTOS CEMENT.

Asbestos cement is generally used when the vessels are exposed to a high temperature

and also when the cemented vessels are intended to hold corrosive acids.

I.

| | |
|-----------------|----------|
| Asbestos powder | 2 parts. |
| Barium sulphate | 3 parts. |
| Sodium silicate | 2 parts. |

By mixing these three substances, a cement may be obtained which will not be affected by nitric acid. But if the cement is to be exposed to hot concentrated acids, the following mixture is recommended.

II.

| | |
|-----------------|----------|
| Sodium silicate | 2 parts. |
| Fine sand | 1 part. |
| Asbestos powder | 1 part. |

Both these cements take a few hours to set. If quick setting cement is required use potassium silicate instead of sodium.

CEMENT FOR WOODEN VESSELS.

For stopping slight leakages in wooden vessels use the following cement:—A mixture of lime-clay and oxide of iron separately calcined and reduced to fine powder, intimately mixed, kept in a close vessel, and mixed with the requisite quantity of water when used.

METAL POLISH.

THERE are some general principles of polishing metals common to all though differing in particulars. At first the surface should be rubbed down by some hard substance producing scratches in all directions. The following are used for the purpose. Emery, or pumice and water, or sand and water applied upon a piece of soft wood, or of felt, skin, or similar material. Next remove the marks left by the pumice by finely powdered pumice ground up with oil. Finer emery and oil may also be used. Certain polishing stones, e.g., a kind of hard slate used with water are used in some cases. To proceed with the polishing finer powders are used, such as tripoli and rotten-stone. Metal polishes of the modern age dispense with these troublesome processes and yield fine polish on rubbing.

Great care must be taken to have the metal polishing preparation uniformly fine. The process of their manufacture simple as it seems is an art and like every other, requires a

certain amount of practical experience as well as a knowledge of the materials entering into the composition of the polishing mixture used and of their preparation for use. To attain a high and uniform grade of polish, the materials must be reduced to a very fine and uniform powder. One single grain of the material larger or sharper than the rest will produce scratches that interfere with the finish to be given to the metal. All the substances should be run through a fine sieve before being used. The following are some of the processes of making metal polish.

LIQUID METAL POLISHES.

I.

Crude oleic acid, 16 lbs.; mineral oil, 4 lbs.; kieselgurh, 5 lbs.; lemon oil, $1\frac{1}{2}$ oz. Make the earthly matter into a paste with the mixed fluids and gradually thin out, avoiding lumps. Apply with one rag and finish with the other.

II.

Prepared chalk, 2 parts; water of ammonia, 2 parts, water sufficient to make 8 parts. The ammonia saponifies the grease usually

present. But this preparation should be handled with care, for it will affect the skin if allowed too free contact.

III.

Powdered tripoli, 3 oz.; tartaric acid, 1 dram; powdered pumice, $\frac{1}{2}$ oz.; gasoline, 14 fl. oz. Shake well and apply with a woollen cloth until the dirt is removed, then polish with chamois.

IV.

Rotten stone, 8 oz.; oxalic acid, 2 oz.; cotton seed oil, 3 oz.; benzine enough to bring the mixture to the right consistency.

V.

Kieselguhr, 56 lbs.; paraffin oil, 3 gallon; alcohol $1\frac{1}{2}$ gallon; camphorated spirit, $\frac{1}{2}$ gallon; turpentine oil, $\frac{1}{2}$ gallon; liquid ammonia fort, 3 pt. Pour the ammonia into the oil, alcohol and turpentine, add the camphorated spirit, and mix with the kieselguhr. To prevent setting, keep well agitated during filling. The colour may be turned red by using a little sesquioxide of iron and less kieselguhr. Apply with a cloth, and when dry, use another clean cloth, or a brush.

METAL POLISHING PASTE.

I.

Take oxalic acid 1 part; rotten-stone 6 parts. Mix with equal parts of train oil and spirits of turpentine.

II.

Petroleum jelly, 42 lbs.; refined paraffin wax, 14 lbs.; powdered bath brick, 14 lbs.; powdered pipe-clay, 14 lbs.; powdered pumice, 2 lbs.; yellow ochre, 2 lbs.; oleic acid, 1 lb; oil cassia, 3 ozs. Melt the wax and jelly, stir in the others, and grind as before. This will give a buff-coloured pomade.

III.

Tallow, 36 lbs; white mineral jelly, 20 lbs; non-gritty chalk, 30 lbs; levigated flint, 4 lbs; powdered pumice, 3 lbs.; oxalic acid, $2\frac{1}{2}$ lbs. Melt the tallow and jelly, powder the acid, mix well with the pumice, flint and chalk, mix all, and grind. This gives a white paste of satisfactory quality.

IV.

Take finely powdered rotten stone, sift it through muslin or a hair sieve, and knead with

a sufficient quantity of soft soap to form a stiff paste. To $\frac{1}{2}$ pound of this mass add $1\frac{3}{4}$ fluid ounces of oil of turpentine. Put in suitable boxes or form into balls, which soon become hard.

The articles to be polished must be entirely free from grease and dirt. Moisten some of the paste with water, apply it to the metal, and rub with a dry rag, when a beautiful lustre will be the result. This is well adapted for household purposes.

V.

Rouge 2 oz; rotten stone 2 lbs.; ground silica 4 oz.; soft soap 8 oz; strong solution of ammonia 2 fl. oz.; water (hot) 12 fl. oz. or sufficient. Dissolve the soap in hot water and mix with the other ingredients, adding ammonia last.

VI.

Wool grease 46 parts; fire clay 30 parts; paraffin 5 parts; carnauba wax 5 parts; oil of mirbane 1 part. Mix the above ingredients and form into a paste. The composition may be used for cleaning brass, copper and bell metal.

VII.

Take Japan wax 100 parts and raw oleic acid 550 parts, melt together and mix with infusorial earth 350 parts and add mirbane oil 3 parts.

VIII.

Mix 1 part of olive oil, 1 of spirit of sal-ammoniac, 2 of lime, and 1 of water to a thick paste. This also cleans glass.

POLISHING-POWDER-FOR-JEWELLERS.**POLISHES FOR GOLD.**

I.

Kieselguhr, 42 lbs; putty powder, 14 lbs; pipeclay, 14 lbs; tartaric acid, $1\frac{1}{2}$ lbs. Powder the acid, mix well with the others. It may be tinted with 12 oz. of oxide of iron, if desired.

II.

Mix 1 part of washed ferric oxide with 50 parts of magnesium carbonate. Moisten a rag with water or alcohol, dip it into the powder, rub and dry with soft leather.

III.

Calcined magnesia is moistened with pure benzine, so as to form a paste sufficiently wet,

so that, when pressed, a drop will exude from it. Pure benzine being very volatile (it boils at $177^{\circ}8^{\circ}\text{F}$) the mixture must be kept in glass bottles with ground stoppers. The articles are cleansed by taking some of the mixture upon raw cotton and rubbing. This is suited for glass and mirrors.

IV.

Ferric oxide obtained from ferrous oxalate by heating can be recommended as an excellent polishing agent for lenses of optical instruments, metals, etc.

N.B. The above recipes (I to IV) will yield good polishing powder for metal, etc. and are not meant for jewellers' use, as wrongly printed on p. 112.

BRASS POLISH.

I.

Oxalic acid 3 parts; water 40 parts; pumice stone 100 parts; turpentine 2 parts; *soft stone* 12 parts; *neats foot oil* 12 parts. Dissolve the oxalic acid in hot water and gradually add the other ingredients.

II.

Take equal parts of sulphur and chalk; and sufficient vinegar to make it to a paste of PR. I. 8.

sufficient consistency. Apply it to the metal while moist; allow it to dry on, and rub with a chamois skin.

III.

Make a wash of 1 oz. alum boiled in $\frac{1}{2}$ pt. strong lye. Wash the brass.' Rub with chamois. This gives a very bright colour.

IV.

Another excellent wash is a weak solution of ammonia. Apply with a rag, and dry with a piece of chamois and a small quantity of jewellers' rouge.

V.

Place 2 oz. sulphuric acid in an earthen vessel and add 1 qt. cold soft water; after the heat that is generated has passed off, add 1 oz. each of tripoli and jewellers' rouge. Bottle when well mixed.

IRON AND STEEL.

I.

Use tin putty and hartshorn triturated in alcohol. Use with any soft leather.

II.

Pulverised arsenious acid $7\frac{1}{2}$ grm., elutriated blood stone $7\frac{1}{2}$ oz., antimony trichloride

33/4 oz., add 5 pt. alcohol 90%. Digest at a gentle heat, shaking frequently. When iron is polished with this fluid, it gives a brilliant lustre and fine appearance.

III.

Blue vitriol, borax, prussiate of potash, charcoal, each 1½ oz.; salt ¾ pt. Pulverise and dissolve in 1½ qt. hot water. Add 1¾ gallon linseed oil; mix well. Bring the iron or steel to the proper heat, and then cool it in this solution.

POLISHES FOR JEWELLERS.

POLISHING POWDER FOR GOLD WORKERS.

I.

This powder, used by Belgian gold and silversmiths, gives an excellent lustre to the articles. It consists of white lead $4\frac{3}{10}$ parts, chalk $17\frac{4}{10}$ parts, carbonate of magnesia $1\frac{7}{10}$ parts, alumina $4\frac{3}{10}$ parts, silica $2\frac{6}{10}$ parts, ferric oxide $1\frac{1}{10}$ parts.

II.

Chalk 18, talc 5, silica 2, alumina 5, carbonate of magnesia 2, jeweller's red 2, by parts.

III.

Burnt and finely powdered rock alum 5 parts; levigated chalk, 1 part; mix and apply with a brush.

FINE JEWELLERS' ROGUE.

Saturate a solution of sulphate of iron (green vitriol) with a solution of oxalic acid. Filter and dry the resulting precipitate of pale-yellow oxalate of iron; place it in an iron dish and expose it to a moderate heat, whereby the oxalic acid will be decomposed and expelled, and a pure sesquioxide of iron will be left. This is very fine and can be used for producing a very brilliant polish upon the finest jewellers' work.

POLISHING POWDER FOR SILVER-WARE.

I.

Mix intimately 4 parts of washed pipe clay, and 1 of purified tartar.

II.

Caustic ammonia 5, water 200, sodium hyposulphite 20, by parts.

III.

Finest whiting 15, soda $1\frac{1}{2}$, citric acid $\frac{3}{8}$, by parts. Reduce to a fine powder used with water.

IV.

Mix thoroughly $4\frac{1}{2}$ parts vaseline, with a few drops of essence of mirbane. Add to this by stirring $7\frac{1}{2}$ parts elutriated chalk, $1\frac{1}{2}$ parts burnt hartshorn, $1\frac{1}{2}$ parts pulverised "cattle bone." The mixture should be of the consistency of butter.

V.

Fine chalk 8 oz., pipe clay 3 oz., white lead 2 oz., magnesia (carbonate) $\frac{3}{4}$ oz.; jewellers' rouge $\frac{3}{4}$ oz.

VI.

Prepared chalk or whiting, $\frac{1}{2}$ lb.; gum camphor, $\frac{1}{4}$ oz.; aqua ammonia and alcohol, of each 1 oz.; benzine, 3 oz.; mix well together and apply with a soft sponge, and allow to dry before polishing.

PHARMACEUTICAL PREPARATIONS.

A LARGE number of medicinal preparations are readily saleable in the market and their manufacture also does not entail a high technical knowledge about the medical science. For example, preparations for alleviating pains and curing skin diseases and ulcers, smelling salts, suppositories are capable of being manufactured with small capital.

PAIN BALM.

I.

| | |
|----------------|--------|
| Methyl salicyl | 2½ oz. |
| Menthol | ½ " |
| Eucalyptol | ½ " |
| Oil cajuputi | ½ " |
| Adipis lanæ | 5 " |
| Ung. paraffin | 11 " |

PROCEDURE:—Adipis lanæ is wool fat. Mix thoroughly. This gives a satisfactory preparation.

II.

| | |
|----------------------|--------|
| Tincture of capsicum | 25 dr. |
| Tincture of camphor | 5 " |
| Aqua ammonia | 10 " |

| | |
|-----------|--------|
| Alcohol | 10 dr. |
| Opodeldoc | 10 „ |

PROCEDURE:—Mix thoroughly and pack.

III.

| | |
|-----------------------------|--------------------|
| Beeswax | $\frac{1}{2}$ lb. |
| Honey | $\frac{1}{2}$ lb. |
| Spirit of turpentine | 1 oz. |
| Oil wintergreen | 2 oz. |
| Laudanum | 2 oz. |
| Lard | $1\frac{1}{2}$ lb. |
| Verdigris (finely powdered) | $\frac{1}{4}$ oz. |

PROCEDURE:—Mix by a stove fire, in a copper kettle and heat slowly.

IV.

| | |
|----------------------|----------|
| Tincture of capsicum | 5 parts. |
| Tincture of camphor | 1 part. |
| Ammonia water | 2 parts. |
| Alcohol | 2 parts. |
| Soap liniment | 2 parts. |

PROCEDURE:—Mix thoroughly.

COMPOSITION FOR HEALING LINIMENT.

| | |
|-------------------|-------------------|
| Olive oil | 2 oz. |
| Spirit of camphor | 2 oz. |
| Chloroform | 2 oz. |
| Sassafras oil | one tea-spoonful. |

PROCEDURE:—First add the oil of sassafras to the olive oil, then the spirit of cam-

phor, and shake very vigorously before putting in the chloroform. Keep the liniment well corked as the chloroform evaporates very fast if left open. Apply three or four times daily, rubbing it well on the affected part only.

UNIVERSAL EMBROCATION.

| | |
|---------------------|--------|
| Cotton seed oil | 15 oz. |
| Oleic acid | 10 dr. |
| Eucalyptus oil | 2½ oz. |
| Solution of ammonia | 12 oz. |
| Oil of turpentine | 7½ oz. |

FRUIT SALT.

I.

The following is a popular substitute for the well-known Eno's fruit salt. But the word "Fruit Salt" being a trade mark cannot be used however.

| | |
|----------------------|-------|
| Tartaric acid | 2 oz. |
| Sodium bicarbonate | 2 " |
| Magnesium sulphate | 1 " |
| Potassium bitartrate | 2 " |
| Magnesium citrate | 2 " |
| White sugar | 4 " |

PROCEDURE:—Powder and mix.

II.

| | |
|--------------------|-------|
| Golden seal root | 4 oz. |
| Magnesium sulphate | 4 " |

| | |
|----------------------------|-------|
| Sodium bicarbonate | 4 oz. |
| Potassium-tartrate of soda | 12 „ |
| Acid tartaric | 3½ „ |

PROCEDURE:—Take all in fine powder, dry them separately, mix well, pass the mixture through a fine sieve and put it at once in clean dry bottles. This is an excellent remedy for dyspepsia and a laxative as well.

SMELLING SALTS

I.

| | |
|--------------------|----------|
| Ammonium carbonate | 2·2 lbs. |
| Ammonia | 1·1 lbs. |
| Oil of bergamot | 0·56 dr. |
| Oil of lavender | 0·9 dr. |
| Oil of nutmeg | 0·28 dr. |
| Oil of cloves | 0·28 dr. |
| Oil of rose | 0·28 dr. |
| Oil of cinnamon | 2·82 dr. |

PROCEDURE:—Mix in a capacious porcelain mortar 2·2 lb. of ammonium carbonate with 1·1 lb. of ammonia, cover the mortar, and let it stand quietly. In the course of a few days the contents will have been converted into normal carbonate of ammonium. The latter is reduced to a coarse powder, and perfumed with bergamot oil, lavender oil, nutmeg oil, clove oil, rose oil, and cinnamon oil. The

incorporation of the volatile oils is effected by first triturating about one-tenth of the salt with the oils, and then gradually incorporating with this perfumed mass the rest of the salt. In this manner a uniform distribution of the odour is effected.

II.

| | |
|---------------------|-----------|
| Ammonium chloride | 7 oz. |
| Potassium carbonate | 9 oz. |
| Oil of lavender | 1 oz. |
| Oil of lemon | 6 drams. |
| Oil of cloves | 30 drops. |
| Oil of bergamot | 2 drams. |
| Ammonia water | q. s. |

PROCEDURE:—Mix the ammonium chloride and potassium carbonate in a bottle and then add the oils and finally enough ammonia water to slightly moisten the mass.

III.

| | |
|----------------------------------|------------|
| Strong tincture of orris root | 2½ ounces. |
| Extract of violet | 3 drachms. |
| Spirit of ammonia | 1 drachm. |
| Ammonium carbonate | q. s. |

PROCEDURE:—Moisten coarsely powdered ammonium carbonate with a mixture of the first three ingredients.

IV.

| | |
|-------------------------|------------|
| Oil of orris | 5 minims. |
| Oil of lavender flowers | 10 minims. |
| Extract of violet | 30 minims. |
| Strong water of ammonia | 2 ounces |
| Ammonium carbonate | q. s. |

PROCEDURE:—Fill suitable bottles with coarsely powdered ammonium carbonate, and add to the salt as much of the solution of the first four ingredients.

V.

| | |
|-----------------|--------|
| Aqueous ammonia | 1 qt. |
| Bergamot oil | 24 gr. |
| Clove oil | 24 " |
| Lavender oil | 45 " |
| Mace oil | 24 " |
| Rosemary oil | 45 " |

PROCEDURE:—Mix together and pour the liquid into an ornamental glass bottle filled with absorbent material such as white glass beads, powdered glass, white pumice stone, potassium sulphate crystals, etc. Fragments of asbestos or sponge may be used. Invert vessel in a porcelain dish to allow excess of liquid to drain out and close with plug of loose cotton wool. This gives an inexhaustible smelling salt.

DIGESTIVE POWDERS AND TABLETS.

I.

| | |
|--------------------|-----------|
| Sodium bicarbonate | 93 parts. |
| Sodium chloride | 4 „ |
| Calcium carbonate | 3 „ |
| Pepsin | 5 „ |
| Ammonium carbonate | 1 part. |

II.

| | |
|----------------------------|------------|
| Sodium bicarbonate | 120 parts. |
| Sodium chlorate | 5 „ |
| Nutritive salt (see below) | 4 „ |
| Magnesium carbonate | 10 „ |

III.

| | |
|---------------------------------|-------------|
| Pepsin, saccharated (U.S.P.) | 10 drachms. |
| Pancreatin | 10 „ |
| Diastase | 50 „ |
| Acid, lactic | 40 drops. |
| Sugar of milk | 40 drachms. |

IV.

| | |
|--------------------|----------|
| Pancreatin | 3 parts. |
| Sodium bicarbonate | 15 „ |
| Milk sugar | 2 „ |

V.

| | |
|--------------------|-------|
| Chebulic myrobalan | 1 dr. |
| Beleric myrobalan | 1 „ |
| Emblie myrobalan | 1 „ |
| Sugar | 1 „ |

| | |
|--------------|-------|
| Long pepper | 1 dr. |
| Black salt | 1 „ |
| Dose 30 grs. | |

VI.

| | |
|--------------|-------|
| Ginger | 3 gr. |
| Black pepper | 3 „ |
| Asafoetida | 1 „ |
| Black salt | 5 „ |

One powder packet after meal.

NUTRITIVE SALT.

| | |
|----------------------------|-----------|
| Calcium phosphate | 40 parts. |
| Potassium sulphate | 2 „ |
| Sodium phosphate | 20 „ |
| Sulphuric, precipitated | 5 „ |
| Sodium chlorate | 60 „ |
| Magnesium phosphate | 5 „ |
| Carlsbad salts, artificial | 60 „ |
| Silicic acid | 10 „ |
| Calcium fluoride | 2½ „ |

DIGESTIVE TABLETS.

| | |
|----------------------------------|-----------|
| Powdered double refined sugar | 30 parts. |
| Subnitrate bismuth | 60 „ |
| Saccharated pepsin | 45 „ |
| Pancreatin | 45 „ |
| Mucilage | 35 „ |
| Ginger | 30 „ |

Mix and divide into suitable sizes.

INDIGESTION TABLETS.

| | |
|----------------------------|---------|
| Capsicum in fine powder | 30 grs. |
| Ipecacuanha root in powder | 12 „ |
| Sodium bicarbonate | 240 „ |
| Strychnine sulphate | 2 „ |
| Extract of Gentian | 60 „ |
| Extract of Rhubarb | 30 „ |

Mix and divide into tablets. Dose 4 to
12 grs.

DIGESTIVE TONIC.

| | |
|------------------------|------------|
| Ammonium carbonate | 20 grains. |
| Potassium bicarbonate | 90 grains. |
| Rhubarb root in powder | 20 grains. |
| Spirit of chloroform | 1½ fl. dr. |
| Peppermint water | 8 fl. oz. |

DIGESTIVE MIXTURE.

| | |
|---------------------------|-----------|
| Sodium bicarbonate | 160 grs. |
| Bismuth carbonate | 160 „ |
| Sodium sulphocarbonate | 120 „ |
| Conc powder of tragacanth | 40 „ |
| Spirit of chloroform | 2 fl. dr. |
| Comp. powder of cardamom | 4 fl. dr. |
| Peppermint water | 8 fl. oz. |

TINC. IODINE, ETC.

TINCTURE IODINE.

Iodine 2·5, rectified spirit 27·5; dissolve with a gentle heat, and when cold, add strong solution of ammonia 6·25; keep the mixture

in a warm place until decolorised; after which dilute it with rectified spirit to 100.

TASTELESS CASTOR OIL.

| | |
|--------------------|------------|
| Pure castor oil | 1 pint. |
| Cologne spirit | 3 fl. oz. |
| Oil of wintergreen | 40 minims. |
| Oil of sassafras | 20 minims. |
| Oil of anise | 15 minims. |
| Saccharine | 5 grains. |
| Hot water | q. s. |

PROCEDURE:—Place the castor oil in a gallon bottle. Add a pint of hot water and shake vigorously for about 15 minutes. Then pour the mixture into a vessel with a stop-cock at its base, and allow the mixture to stand for 12 hours. Draw off the oil, excepting the last portion, which must be rejected. Dissolve the essential oils and saccharine in the cologne spirit and add to the washed castor oil. Finally filter, and put up in small, well-stoppered bottles.

MANUFACTURE OF IODOFORM.

Put 100 parts of iodine in a comparatively long-necked flask, add 100 parts bicarbonate of potassium, 1200 parts of distilled water, and 250 parts of alcohol; insert a cork through

which passes a long glass tube; heat in a water bath, not too quickly, to about 176°F (80°C); and add after decoloration of the liquid, 25 parts of iodine; then add 20 and afterwards 10 parts of iodine, waiting with each addition till the liquid has lost its brown colour. If iodine should happen to be a little in excess, add cautiously some solution of potash until decolorised, which shows completion of the process. Now pour the liquid into a porcelain dish, cover and let stand for 24 hours; throw on a filter, and wash the iodoform with cold distilled water. The iodoform which has separated is now spread on folds of bibulous paper and dried in the open air.

SUPPOSITORIES.

These are combinations of medicinal substances with cocoa, butter, suet, soap, etc., made into suitable form, round, cylindrical or conical, for introduction into the rectum. When made with cocoa butter or suet, these should be melted at gentle heat, with sufficient white wax (one-twelfth to one-eighth, according to the season of the year) to give suitable consistence, and the medicinal sub-

tance being then thoroughly incorporated, the whole is poured into suitable moulds to cool. With but little ingenuity, moulds, in the absence of metallic ones made for this purpose, may be made from stiff paper, and may be supported while filling and cooling by placing them upright in dry sand; or they can be moulded into suitable form with the fingers. A suppository should not ordinarily weigh more than a drachm, and should not exceed in size the point of the little finger. When introduced into rectum the suppository melts or is dissolved, and the medicinal substance then develops its effects. This is an excellent form for administering medicine in many cases, and is less frequently used than it deserves.

BASIS.

| | |
|-------------------------------|------------|
| Fine white gelatin, in shreds | 10 oz. |
| Distilled water | 20 fl. oz. |
| Glycerine | 50 oz. |

PROCEDURE:—Allow to soften and add glycerin at 30°F. 50 oz. by weight. While dissolving stir gently so as to avoid creating air bubbles. Strain through muslin. This is
Pr. I. 9.

an expeditious method, and preferable to that of the B. P.

II.

| | |
|------------------|---------------|
| Stearic acid | 2½ dr. |
| Sodium carbonate | 75 gr. |
| Glycerine | 5 oz. avoird. |

PROCEDURE:—Melt the stearic acid with the glycerine and add the carbonate, stir well. Pour the clear mixture into moulds. The suppositories, which should be quite clear, contain 95 per cent. glycerine.

III.

| | |
|--------------------|---------|
| Anhydrous wool fat | 1 part. |
| Oil of theobroma | 99 „ |

PROCEDURE:—Melt together and stir while cooling. This gives a tough basis, with which extracts, liquids etc. can be readily incorporated.

SKIN DISEASES.

RINGWORM OINTMENT.

Tar, 3 dr.; lard, 1½ oz.; acetic acid 2 fl. oz. Melt together tar and lard and stir in acetic acid.

Direction for use: The hairs of the affected part must be cut off close and washed clean before each application.

II.

A lotion of bichloride of mercury is often sufficient to destroy the ringworm, but if it proves ineffectual glacial acetic acid may be painted all round the spreading margins.

III.

Chlorine water, 1 part and lard, 8 parts are well triturated together. Also used in itches and foetid ulcers.

IV.

| | |
|------------------|-------|
| Paraffin wax | 1 lb. |
| Yellow vaseline | 1 lb. |
| Crysophonic acid | 2 oz. |
| Melt and mix. | |

BARBER'S ITCH.

| | |
|-------------------------------|------------|
| Ichthyol | 30 grains. |
| Salicylic acid | 12 grains. |
| Mercury oleate (10 per cent.) | 3 drachms. |
| Lanolin | 1 ounce. |

PROCEDURE:—Mix. To be kept constantly applied to the affected parts.

BALM FOR ULCERS, BURNS, ETC.

Boric acid in powder 1 part; soft paraffin 4 parts; hard paraffin, 2 parts. Melt, mix and stir till cold.

GREEN SALVE.

| | |
|--------------------------|------------|
| White turpentine | 8 ounces. |
| Lard, fresh | 8 " |
| Honey | 4 " |
| Beeswax, yellow | 4 " |
| Melt, stir well, and add | |
| Verdigris, powdered | 4 drachms. |

Apply locally. This cannot be surpassed when used for deep wounds, as it prevents the formation of proud flesh and keeps up a healthy discharge.

SALVE FOR ALL WOUNDS.

| | |
|-------------------|------------|
| Lard, fresh | 16 ounces. |
| White lead, dry | 3 " |
| Red lead, dry | 1 " |
| Beeswax, yellow | 3 " |
| Black rosin | 2 " |
| Common turpentine | 4 " |

Mix all excepting turpentine, melt, and boil for 45 minutes, then add turpentine. Boil for 3 minutes and cool.

Apply locally to cuts, burns, sores, ulcers, etc. It first draws, then heals.

SKIN OINTMENT.

I.

Add about 2 per cent of phenol to petrolatum, perfuming it with oil of bergamot and

colour a dull green. It has been suggested that a mixture of Prussian blue and yellow ochre would answer as the colouring agent.

II.

| | |
|-----------------|------------|
| Phenol | 40 grains. |
| Boric acid | 2 drachms. |
| Oil of bergamot | 90 minims. |
| Petrolatum | 1 pound |
| Chlorophyll | q. s. |

ECZEMA OINTMENT.

I.

| | |
|---------------------------------------|----------|
| Acid salicylic | 1.3 grm. |
| Ointment of zinc oxide | 8.0 " |
| Hydrous wool fat | 8.0 " |
| Solution of calcium hydroxide to make | 60 grm. |

II.

| | |
|----------------------|-------------------|
| Hydrarg. ammon chlor | 10 gr. |
| Plumbi acet | 10 gr. |
| Zinc oxide | 1 dr. |
| Ung. hydrarg nit | 20 gr. |
| Adipis | $\frac{1}{2}$ oz. |
| Ol. palmae | $\frac{1}{2}$ oz. |

CORN SALVE.

I.

| | |
|-------------------|-------|
| Salicylic acid | 6 dr. |
| Methyl salicylate | 2 dr. |

| | |
|--------------------|--------|
| Wool fat | 2 oz. |
| Yellow wax | 2 oz. |
| Lard (benzoinated) | 11 oz. |

II.

| | |
|------------------|-----------|
| Salicylic acid | 100 parts |
| Hydrous wool fat | 100 " |
| White wax | 100 " |
| Soft paraffin | 100 " |
| Creosote | 50 " |
| Cocaine | 1 " |

III.

| | |
|----------------|-----------|
| Salicylic acid | 15 parts. |
| Creosote | 10 " |
| Lard | 10 " |
| Hard paraffin | 30 " |
| Soft paraffin | 35 " |

MISCELLANEOUS PREPARATIONS.

CAMPHOR ICE.

| | |
|--------------------------|---------|
| Spermaceti | 4 oz. |
| White wax | 8 oz. |
| Almond oil | 16 oz. |
| Melt and add | |
| Flowers of camphor | 4 oz. |
| Essential oil of almonds | 30 min. |
| Expressed oil of mace | 2 dr. |

MENTHOL CAKE.

| | |
|------------|--------|
| Camphor | 1 oz. |
| Spermaceti | 1½ oz. |
| White wax | 3 oz. |

Melt and add

Oil of almonds 4 oz.

Menthol 1 dr.

CODLIVER OIL EMULSION.

Calcium hypophosphite

80 grains 80 grains.

Sodium hypophosphite 120 "

Sodium chloride 60 "

Gum acacia in powder 2 oz.

Elixir of glucoside 20 minims.

Essential oil of almonds 15 "

Glycerine 2 fl. oz.

Codliver oil 8 "

Distilled water to produce 16 "

REMEDIES FOR INSECT BITES.

I.

Carbolic acid 15 grains.

Glycerine 2 drachms.

Rose water 4 ounces.

II.

Salicylic acid 15 grains.

Collodion $2\frac{1}{2}$ drachms.

Spirit of ammonia $5\frac{1}{4}$ drachms.

III.

Fluid extract rush-
toxicodendron 1 drachm.

Water 8 ounces.

IV.

| | |
|-------------------|-----------|
| Ipecac, in powder | 1 drachm. |
| Alcohol | 1 ounce. |
| Ether | 1 ounce. |

V.

| | |
|--------------------|------------|
| Betanaphthol | 30 grains. |
| Camphor | 30 grains. |
| Lanolin cold cream | 1 ounce. |

VI.

Spirit of sal ammoniac has favourable action upon fresh insect bites. The presence of potassium carbonate like spirit of sal ammoniac, deadens the effect of the small quantities of acid (formic acid, etc.) which have been introduced into the small wound by the biting insect.

LIME JUICE CORDIAL.

| | |
|------------------|----------|
| Glucose syrup | 8 gals. |
| Cane sugar | 108 lbs. |
| Water | 20 gals. |
| Lime juice | 18 gals. |
| Oil of orange | 4 dr. |
| Oil of nutmeg | 4 dr. |
| Salicylic acid | 2 oz. |
| Rectified spirit | 10 oz. |

Dissolve the sugar in the water by heat, add the limejuice and glucose syrup. Dissolve the oils and the acid in the spirit, mix with the cordial and filter through a felt bag.

TOILET PREPARATIONS.

VARIOUS toilet preparations are in active demand in the market. The methods of preparing essences, hair oils, eau de cologne, floral oils, ottos have already been treated in *Indian Perfumes Essences and Hair Oils*. Mode of manufacturing pomades, brilliantines, face creams, hair preparations, etc. here follows:—

POMADES.

The chief ingredient in all pomades is a soft white basis of white wax, spermaceti, lard, suet, vaseline, etc. When lard, suet, vaseline, etc. are used they should be previously refined and made free of all impurities and obnoxious matters. Other fats such as olive oil, almond oil, etc. may also be employed in conjunction with the above to serve as the basis.

THE MODE OF PREPARATION.

To prepare the pomade the first step is to melt the pomade stock on a water bath and then add the olive and almond oils. Now the pan

is removed from fire and when it begins to thicken stir in various scents in proportions at discretion.

In preparing pomades the manufacturers may note that an addition of soap improves pomades. Before perfuming add about 250 parts of soap dissolved in hot water and about $1\frac{3}{4}$ parts of borax to 12,500 parts of pomade stock. This renders the pomade as white as snow and very emollient, which is very difficult to attain by an addition of stearine. This pomade will bear an admixture of one-third water.

In colouring pomades use is generally made of alkanet root, annotto, gamboge root, chlorophyll, etc. It is usual to tie up the drug in a piece of coarse cloth and dip in a part of the pomade stock. Gentle heat may be applied and the whole squeezed from time to time. The strongly coloured stock may be diluted with ordinary stock to bring it to the desired shade.

I.

| | |
|-----------|------------|
| Lard | 250 parts. |
| White wax | 25 „ |

| | |
|--------------|------------|
| Vaseline | 200 parts. |
| Bergamot oil | 15 „ |
| Lavender oil | 3 „ |
| Geranium oil | 2 „ |
| Lemon oil | 2 „ |

PROCEDURE:—Melt lard and wax at moderate heat and mix well with the vaseline. Add the essential oils and mix well.

II.

| | |
|-----------------|--------------------|
| Prepared suet | 10 lbs. |
| White wax | $\frac{3}{4}$ lbs. |
| Oil of bergamot | 1 oz. |
| Oil of lemon | $\frac{1}{2}$ oz. |
| Oil of rosemary | $\frac{1}{4}$ oz. |
| Oil of lavender | $\frac{1}{4}$ oz. |
| Rose water | 1 pint |

PROCEDURE:—Melt the suet and wax at moderate heat. Take from fire and while thickening add the perfumes and mix well.

III.

| | |
|----------------|------------------------|
| White wax | 2 $\frac{1}{2}$ parts. |
| Spermaceti | 50 „ |
| Oil of almonds | 50 „ |
| Rose water | 33 „ |

PROCEDURE:—Melt the first two on water bath. Add oil of almonds while the pan is still on the water bath and stir vigorously.

Finally take away from fire and add rose water.

IV.

| | |
|----------------|-----------|
| White wax | 33 parts. |
| Spermaceti | 33 " |
| Oil of almonds | 250 " |
| Glycerine | 66 " |
| Rose oil | 2/5 " |

PROCEDURE:—Melt the first two ingredients on water bath and add the oil of almonds and glycerine. Take away from fire and add rose oil.

V.

| | |
|-----------------------|------------|
| Olive oil | 200 parts. |
| Spermaceti | 50 " |
| Oil of bergamot | 5 " |
| Oil of neroli | 1 part. |
| Oil of carnation pink | 3 parts. |

PROCEDURE:—Melt the spermaceti on water bath and stir in olive oil. Take away from fire and add the rest.

VI.

| | |
|----------------------------|------------|
| Lard | 150 parts. |
| Salicylic acid | 15 " |
| Spirit of wine of 91 p. c. | 30 " |

PROCEDURE:—Melt the lard, then take the pan away from fire and stir in the essence.

VII.

| | |
|-----------------------|------------|
| Soft lard | 120 parts. |
| Neroli oil | 3 " |
| Bergamot oil | 3 " |
| Lemon oil | 3 " |
| Tincture of ambergris | 1 " |
| Tincture of musk | 1/15 " |
| PROCEDURE:—As above. | |

VIII.

| | |
|----------------------|------------|
| Soft pomade fat | 400 parts. |
| Petit grain oil | 10 " |
| Neroli oil | 2 " |
| Rose oil | 2 " |
| Oil of geranium | 2 " |
| Oil of cinnamon | 1 part. |
| Peruvian balsam | 1 part. |
| Tincture of musk | 1/5 " |
| PROCEDURE:—As above. | |

IX.

| | |
|------------------|--------|
| Lard | 4 lbs. |
| Suet | 1 lb. |
| Alkanet (pieces) | 1 lb. |
| Rose water | 5 oz. |
| Otto of rose | q. s. |

PROCEDURE:—Macerate the first three ingredients with heat to give a faint colour, the alkanet being tied up in a piece of coarse cloth. Finally allow it to cool and before it

sets stir in the rose water and otto of rose enough to scent. This is known as rose pomade.

X.

| | |
|------------------|-----------|
| Olive oil | 90 parts. |
| White wax | 30 " |
| Spermaceti | 30 " |
| Alkanet (pieces) | 3 to 4 " |
| Essential oils | 4 " |
| Rose oil | q. s. |

PROCEDURE:—Melt the first three ingredients in a porcelain dish and dip into it alkanet roots tied up in cloth. When the mass appears coloured take away the alkanet. Allow to cool and add the rest.

FACE POWDERS.

I.

| | |
|--------------------|-------------------|
| Powdered talc | 5 lbs. |
| Oil of rose | $\frac{1}{2}$ dr. |
| Extract of jasmine | 4 oz. |

PROCEDURE:—Talc should be in the state of fine division. The oils should be triturated first with a small portion of the powdered talc. This should then be further triturated with a larger portion. If the quantity operated be large, the final mixing may be effected by sifting.

II.

| | |
|----------------------|-----------|
| Talcum powder | 1 lb. |
| Starch | 1 lb. |
| Oil of neroli | 20 drops. |
| Oil of ylang ylang | 10 drops. |
| PROCEDURE:—As above. | |

III.

| | |
|----------------------|---------|
| Talcum powder | 3 lbs. |
| Starch | 12 oz. |
| Orris root | 6 oz. |
| Oil of bergamot | 36 min. |
| PROCEDURE:—As above. | |

IV.

| | |
|-----------------------|----------|
| Zinc. oxide | 7 oz. |
| Talcum powder | 9 " |
| Precipitated chalk | 1 " |
| Magnesium carbonate | 1 " |
| Extract of jasmine | 30 mins. |
| Extract of white rose | 15 mins. |

PROCEDURE:—Mix well and run through fine sieve.

V.

| | |
|----------------|--------|
| White talcum | 8 lbs. |
| Fine kaolin | 4 lbs. |
| Essential oils | q. s. |

PROCEDURE:—As above.

VI.

| | |
|-------------------|-------------|
| Starch | 3150 grams. |
| Rose oil | 2 grams. |
| Bergamot oil | 20 mins. |
| Attar of roses | 10 mins. |
| Rose geranium oil | 60 mins. |

PROCEDURE:—As above.

VII.

| | |
|-----------------------|---------|
| Precipitated chalk | 20 lbs. |
| Subnitrate of bismuth | 42 oz. |
| Zinc white | 42 oz. |
| Oil of lemon | 1½ oz. |

PROCEDURE:—As above.

VIII.

| | |
|------------------------------------|-----------|
| Precipitated chalk | 30 parts. |
| Zinc white | 5 " |
| Starch | 10 " |
| Steatite | 5 " |
| Triple extract of rose | 3 " |
| Triple extract of jasmine | 3 " |
| Triple extract of orange flower | 3 " |
| Triple extract of cassia | 3 " |
| Tincture of musk | 8 " |

PROCEDURE:—Triturate the essential oils with a small portion of zinc white. Then incorporate with the rest. Orris root may be used in place of the essential oils.

IX.

| | |
|-----------------------|-------------------|
| Corn starch | 20 lbs. |
| Talc | 38 " |
| Precipitated chalk | 25 " |
| Magnesium carbonate | 10 " |
| Bismuth oxychloride | 7 " |
| Salicylic acid | 43 gr. |
| Oil of rose | 5 dr. |
| Heliotropine | $\frac{1}{2}$ oz. |
| Oil of bitter almonds | 10 drops. |

PROCEDURE:—Triturate oils, heliotropine and salicylic acid with bismuth oxychloride thoroughly. Then mix with the remaining ingredients and sift.

XI.

A face powder of rosy hue may be prepared as follows:—

| | |
|-------------------|-----------|
| Starch | 1000 gms. |
| Carminc | 10 " |
| Otto of rose | 15 " |
| Otto of khus khus | 15 " |
| Sandal oil | 15 " |

XII.

| | |
|-----------------|---|
| Oxide of zinc | 1 oz. |
| Starch | $8\frac{1}{4}$ oz. |
| Essence of rose | 5 to 10 drops. |
| Carminc | quantity required for producing the de- sired tint. |

FACE LOTION.

| | |
|---------------------|-------------------|
| Syrupy lactic acid | 40 oz. |
| Glycerol | 80 oz. |
| Distilled water | 5 gal. |
| Tincture of benzoin | 3 oz. |
| Carminc No. 40 | 40 grains |
| Glycerol C. | 1 oz. |
| Ammonia solution | $\frac{1}{2}$ oz. |
| Water | 3 oz. |
| Solution of ionone | 1 drachm |
| Kaolin | q. s. |

. PROCEDURE:—Mix lactic acid and glycerol in distilled water and add tincture of benzoin. Then colour with carmine and glycerol, ammonia solution and water. Heat this to drive off ammonia and mix all. Shake and set aside, then filter and add ionone and add a small quantity of kaolin and filter until optically clear.

COMPLEXION CREAM.

Complexion creams give the skin a beautiful, smooth, and fresh appearance, and at the same time serves to protect and preserve it.

I.

| | |
|----------------------|---------|
| Soft paraffin, white | 300 oz. |
| Sodium perborate | 10 oz. |
| Perfume as desired. | |

II.

| | |
|---------------------|--------|
| Lard | 30 oz. |
| Ceresine | 150 „ |
| White soft paraffin | 150 „ |
| Sodium perborate | 100 „ |
| Perfume as desired | |

III.

| | |
|---------------------|----------|
| Alum, powdered | 10 grams |
| Whites of | 2 eggs |
| Boric acid | 3 grs. |
| Tincture of benzoin | 40 drops |
| Olive oil | 40 „ |
| Mucilage of acacia | 5 „ |
| Rice flour | q. s. |
| Perfume | q. s. |

PROCEDURE:—Mix the alum and the white of eggs, without any addition of water whatever in an earthen vessel and dissolve the alum by the aid of very gentle heat (derived from a lamp, or gas light, regulated to a very small flame), and constant, even, stirring. This must continue until the aqueous content of the albumen is completely driven off. Care must be taken to avoid coagulation of the albumen (which occurs very easily, as all know). Let the mass obtained in this manner get completely cold, then throw into a wedge-wood

mortar, add the boric acid, tincture of benzoin, oil, mucilage (instead of which a solution of fine gelatin may be used) etc., and rub up together, thickening it with the addition of sufficient rice flour to give the desired consistence, and perfuming at will. Instead of olive oil any pure fat, or fatty oil, may be used, even vaseline or glycerine.

FACE CREAM.

Face creams may broadly be divided into two classes, viz. cold cream and snow cream. In snow creams borax or sodium carbonate is employed just to neutralise the stearic acid used to form a soapy cream while in cold creams waxes and almond oil are incorporated together. Proper care is to be devoted to whip the mass until a foamy product results. Allow to stand for a few days before bottling so that air bubbles may escape.

I.

Take spermaceti $4\frac{1}{2}$ oz., white wax 3 oz., fresh oil of almonds 18 oz.; melt over a water bath and pour in marble mortar and stir briskly to prevent granulation. When the mixture becomes of the consistency of butter, triturate

until it has a white, creamy appearance; add gradually a mixture of double water of roses, $1\frac{1}{2}$ oz.; odourless glycerine, $1\frac{1}{2}$ oz.; mix for 20 minutes, then add 15 drops of essence of roses and beat for about half an hour, when it will be ready for use.

II.

Take white wax, 20 grams, spermaceti 25 grams, bleached expressed oil of mustard, 140 grams, rose water, 80 grams; bleached expressed oil of mustard, 20 grams; borax 1 gram; rose oil; 6 drops. The wax and spermaceti are dissolved in the expressed oil of mustard by gently warming on a water bath, the mixture is then rubbed down to a fine salve. The borax is next dissolved in the rose water which has been previously warmed and is then incorporated with the mass. Finally, the balance of the rose oil and mustard oil is rubbed up with the above mixture, when a smooth ointment will be obtained.

III.

| | |
|------------|------------------|
| White wax | 3 oz. |
| Spermaceti | $2\frac{1}{2}$ " |
| Almond oil | 15 " |

| | |
|-------|------------|
| Borax | 120 grains |
| Water | 10 oz. |

PROCEDURE:—Melt together, transfer to a warm mortar, and add by degrees borax, 120 grains, dissolved in water 10 oz. Continue the beating until almost cold, add the desired perfume, and stir occasionally during the next few hours. If this is too soft for summer use, it may be stiffened by the addition of spermaceti, $\frac{1}{4}$ oz., and white wax, $\frac{1}{4}$ oz.

IV.

| | |
|----------------|-----------|
| Oil of almonds | 425 parts |
| Lanolin | 185 " |
| White wax | 62 " |
| Spermaceti | 62 " |
| Borax | 4.5 " |
| Rose water | 300 " |

PROCEDURE:—Melt together the first four ingredients, then incorporate the solution of borax in rose water.

V.

| | |
|----------------------|------------|
| Spermaceti | 100 grains |
| Pure wax | 100 " |
| Oil of sweet almonds | 500 " |
| Rose water | 50 " |
| Otto of rose | q. s. |

PROCEDURE:—Dissolve the fatty matters in a water-bath, pour the liquid into a marble vessel, and when the contents solidify stir with a pestle till uniformly white. During stirring add 5 or 6 drops of otto of roses.

VI.

| | |
|------------------|-----------|
| Stearic acid | 120 grams |
| Sodium carbonate | 18 " |
| Glycerine | 14 " |
| Hamamelis water | q. s. |

PROCEDURE:—Melt the acid in an enamelled vessel of 4 litres capacity over water bath and add the carbonate dissolved in minimum amount of hot water. Keep the mixture on the water bath for one hour stirring gently all the while. Add sufficient hamamelis water to bring the preparation to 600 grams. Return the container to the water bath for a minute or two, stirring the mixture until perfectly smooth. Pour into a warm mortar and beat to a foam. Let it stand for 12 hours, stir with a spatula and pack.

VII.

| | |
|--------------|------------|
| Stearic acid | 1000 parts |
| Almond oil | 500 " |

| | |
|--------------|-----------|
| Rose water | 260 parts |
| Bergamot oil | 10 " |
| Geranium oil | 5 " |
| Lemon oil | 4 " |

PROCEDURE:—Melt the stearic acid at moderate heat and stir in almond oil and rose water. Beat till frothy and scent with the essential oils.

VIII.

| | |
|------------------|-------------------|
| Stearine | 2 oz. |
| Sodium carbonate | $\frac{1}{4}$ oz. |
| Borax powder | $\frac{1}{4}$ oz. |
| Glycerine | 4 fl. oz. |
| Water | 2 pt. |
| Perfumes | q. s. |

PROCEDURE:—Mix all together and heat over water bath until, there is no further effervescence. Then remove and stir adding oil of rose, ylang ylang, heliotropine or bergamot dissolved in alcohol. Agar-agar or tragacanth mucilage may be added but in that case the amount of water to be added must be decreased.

IX.

Melt spermaceti 20 oz., white wax 20 oz. and white petrolatum 60 oz. over water bath

and mix 400 grains of borax dissolved in 70 oz. of rose water at a time to the melted matter. Stir well.

X.

Petroleum oil 600 gr.; white wax 60 gr.; paraffin 140 gr.; Eau de Cologne 30 gr.; water 200 gr.; rose water 200 gr.; tincture of benzoin 10 gr.; oil of rose geranium 10 drops. Mix the solid matter in the warm oils and pour into the mixture little by little, stirring at the same time Eau de Cologne and the perfumes. Stir well to get perfectly white.

HAIR PREPARATIONS.

HAIR CREAM.

Non-greasy hair creams are generally made with white powdered tragacanth and small quantities of glycerine. The gum is mixed with alcohol, the glycerine and perfumes added, and the whole transferred to a whisking machine. The water is poured in gradually until the volume is attained and the liquid is allowed to thicken. It is then strained through muslin and bottled.

| | |
|------------------|----------|
| Tragacanth | 10 grams |
| Tincture of tolu | 5 c. c. |

| | |
|---------------------|------------|
| Alcohol | 50 c. c. |
| Glycerine | 20 c. c. |
| Hydroxy-citronellol | 2 c. c. |
| Ylang Ylang oil | 2 c. c. |
| Linalol | 5 c. c. |
| Jasmine absolute | 1 c. c. |
| Water to produce | 1000 c. c. |

HAIR RESTORER.

| | |
|------------------|----------|
| Magnesia | 7 parts. |
| Rosemary oil | 1½ " |
| Rectified spirit | 7 " |
| Distilled water | 1,000 " |

Mix the oil with the spirit of wine and rub up with the magnesia in a mortar; gradually add the water and gradually filter.

HAIR FIXATIVE.

Dissolve 20 grams of boric acid in 1 litre of rose water; add 50 grams of gum tragacanth. After several hours, heat the mixture on a water bath and filter through gauze. Perfume with 5 grams of oil of rose geranium and 2 grams of phenyl ethyl alcohol, and finally add 100 grams of tincture of benzoin. Triturate in a mortar and pour into pots.

HAIR TONIC.

| | |
|-----------------------|-----------|
| Betanaphthol | 10 grains |
| Quinine hydrochloride | 5 " |

| | |
|----------|-------------|
| Resorcin | 10 grains. |
| Bay rum | 5 oz. |
| Water | upto 20 oz. |

HAIR COLOUR RESTORERS.

| | |
|-------------------------|---------|
| Lead acetate | 2 drams |
| Precipitated sulphur | 2 " |
| Glycerine | 6 " |
| Rose water | 8 oz. |
| Distilled water to make | 16 oz. |

PROCEDURE:—Damp the sulphur with spirit and mix with the lead acetate and glycerine, then dilute gradually with the water.

COCONUT OIL SHAMPOO.

| | |
|---------------------|---------|
| Coconut oil | 4 drams |
| Ammonia water (10%) | 6 dr. |
| Spirit of rosemary | 1½ oz. |
| Eau de Cologne | 1½ oz. |
| Tincture of saffron | 2 dr. |

PROCEDURE:—Mix the oil and ammonia shaking well and then add the other ingredients. To be shaken before use.

✓ HAIR CURLING SOLUTION.

It is not possible to render straight hair curly without the aid of iron, paper, or other curlers. But it is possible on the other hand to make artificial curls more durable and proof

against outside influences. The following recipe will help to curl hair.

I.

| | |
|----------------|----------|
| Water | 70 parts |
| Spirit of wine | 30 „ |
| Borax | 2 „ |
| Perfume | q. s. |

II.

| | |
|--|------------|
| Amonium carbonate | 4 drs. |
| Strong solution of ammonia | 2 drs. |
| Mucilage of acacia | 43 grs. |
| Alcohol (70 per cent) | 2 oz. |
| Rose water, a sufficient quantity to produce | 20 fl. oz. |

PROCEDURE:—Mix, moisten the hair thoroughly with a little of the liquid and adjust lightly; it will curl as it dries. The best results are obtained if the hair be first washed, with a little soft soap and water containing a few drops of solution of ammonia.

HAIR LOTION.

I.

| | |
|-----------------------------|-----------------|
| Resorcin | 1 dr. |
| Castor oil | 2 „ |
| Balsam of Peru | $\frac{1}{2}$ „ |
| Oil of geranium | 10 min. |
| Oil of lavender | 10 min. |
| Alcohol 45 per cent to make | 8 oz. |

II.

| | |
|------------------|---------------------|
| Rectified spirit | 1 quart. |
| Rose water | $\frac{1}{2}$ pint. |
| Oil of lemon | $\frac{1}{2}$ oz. |
| Otto de rose | 15 minims. |
| Oil of cloves | 30 minims. |
| Oil of neroli | 10 minims. |

Mix, shake well and leave aside for some time.

III.

| | |
|-------------------|-------|
| Oil lavender | 3 oz. |
| Essence lemon | 3 " |
| Essence ambergris | 4 " |
| Oil carraway | 2 " |
| Rose water | 12 " |
| Proceed as above. | |

IV.

| | |
|----------------------|---------|
| Rectified spirit | 1 pint. |
| Oil of rosemary | 1 oz. |
| Essence of ambergris | 2 dr. |
| Rose water | 6 oz. |
| Proceed as above. | |

LIME JUICE GLYCERINE.

I.

Lime or lemon-juice $\frac{1}{2}$ a pint; heat in a porcelain mortar to near the boiling point, and add gradually rose water, elder-flower water, and rectified spirits, of each 2 ounces. Agitate

the whole together. After 24 hours' repose, decant or filter through calico or muslin, then add of pure glycerine $2\frac{1}{2}$ ounces and oil of lemons half drachm. Again agitate them together for some time, and by careful manipulation you will have a somewhat milky liquid free from floating matter or sediment.

II.

| | |
|--------------|--------------------|
| Almond oil | $3\frac{1}{2}$ oz. |
| Oil of lemon | 1 dr. |
| Lime water | 8 oz. |
| Glycerine | 1 dr. |

Mix well by shaking. This cream separates a little clear oil, but is a good article.

III.

| | |
|--------------------|-------------------|
| Tincture of senega | $\frac{1}{2}$ dr. |
| Almond oil | 1 oz. |
| Glycerine | 2 dr. |
| Lime juice | 1 oz. |
| Rose water | 2 oz. |
| Oil of lemon | 10 drops. |
| Oil of bergamot | 5 „ |

PROCEDURE:—Shake the first two well and add glycerine, lime juice and rose water. Finally perfume with essential oils.

If the lime cream becomes rancid add 4 gr. salicylic acid to each pint of the cream.

IV.

| | |
|-----------------------------|--------------------|
| White wax | 1 part |
| <i>Oil of sweet almonds</i> | 20 parts |
| Lime water | 22 „ |
| Glycerine | 2 „ |
| Oil of lemons | $\frac{1}{2}$ part |

The advantage of this preparation is that it does not become rancid and by reason of the citric acid contained, exerts a stimulating effect on the roots of the hair.

BRILLANTINES.

The formulas for this type of product usually call for either olive oil, castor oil, almond oil or mineral oils. To one of these oils, or a mixture of two or more of them, a small amount of wax is added. The best suitable hardening agent is spermaceti. With it, if properly handled, the most beautiful preparations may be produced, and the secret of producing an attractive preparation lies more in the process of manufacture than in the formula.

If we melt any of these oils together with spermaceti (any other wax is not so well suitable), and allow the process of cooling to take place very slowly and without the slightest

agitation, quite different results will be obtained. The mixture will, provided the correct proportions of ingredients were used, produce a most beautiful semi-transparent mass which appears to be composed of a vast number of very fine crystals. To obtain such a preparation, however, various precautions are advisable or necessary. First the heating and melting has to be done very carefully, and any excesses of heat must be avoided. It should always be carried out with the aid of a hot-water bath rather than on the open flame. The heating should be discontinued as soon as the entire amount of spermaceti is melted, but the vessel not removed from the water bath. The purpose for this is to allow the brilliantine to cool down with the water in the water bath so as to assure a very slow cooling. The slower this takes place, the more beautiful the crystallisation will be. Before the cooling of the brilliantine, of course, it is necessary to introduce the colour and perfume. For the first yellow, reddish brown or brown may be used, but the most attractive effect is obtained by using a green coloration. In

fact most of these kinds of brilliantines on the market are coloured green. Care should be taken not to obtain too deep a shade, as this will spoil the effect, whether it be green or any other colour. To leave the brilliantine white is not advisable as the effect of beauty of the preparation is considerably reduced by neglecting the coloration. As to the perfume, here again almost any odour is suitable. Of a vast number of odours and odour combinations that of lily of the valley combined or blended with a fragrant lilac odour has been found to give the most excellent and delicate perfume for this type of cosmetic.

I.

Suet 40 oz.; wax 40 oz.; sesame oil 40 oz. Melt in a water bath, and under assiduous stirring, so as to make a foamy mixture. Add castor oil 21 oz. and thick tragacanth mucilage 20 oz. made with rose water.

II.

Lard $3\frac{1}{2}$ oz.; spermaceti $3\frac{1}{2}$ oz.; almond oil $3\frac{1}{2}$ oz.; wax 1 oz. Mix.

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III.

Alcohol 60 per cent., 4 oz.; castor oil, 2 oz.; neroli oil, 20 minims; oil of rose geranium, 5 minims; oil of verbena, 5 minims; oil of lemon, 50 minims. Colour yellow with saffron.

IV.

Glycerine, 1 part; castor oil, 3 parts; absolute alcohol, 60 parts. Perfume to taste.

V.

Olive oil, 4 parts; glycerine, 3 parts; alcohol, 3 parts; scent as desired. Shake before use.

INCENSE STICKS.

I.

Aguru 1 ch., sandal dust 1 ch., camphor 1 ch., gugul 1 ch., cassia leaves 1 tola, deodar wood 1 tola, jatamansi 1 tola, costus root $\frac{1}{2}$ ch., vetiver root 1 ch., white dammar 2 ch., nagarmoth 1 tola, sugarcane molasses 1 tola. Mix these ingredients together; add 4 pieces of lakhi and soak for 3 days. Then grind well into paste and make into incense sticks.

II.

Aguru 1 ch., white dammar 1 ch., gugul 1 tola, sandal dust 4 ch., lakhi 1 piece, cane molasses 1 tola, cassia leaves 1 tola. Mix them together and grind. Make incense sticks from the paste.

III.

Dried rose petals 4 ch., olibanum 1 ch., camphor 1 tola, privangu 1 tola, costus root 1 tola, dammar 1 tola, gugul 1 tola, cassia leaves 1 tola, cardamom major 1 tola, myrobalan 5 pieces, lakhi 4 pieces. Mix together, grind well and form sticks.

IV.

Musk $\frac{1}{2}$ tola, saffron 1 tola, aguru 1 ch., nilotpala 1 tola, benzoin 1 ch., dammar 1 tola, gugul 1 tola. Grind together these ingredients.

V.

| | |
|-----------------|--------|
| Gum olibanum | 20 dr. |
| Gum benzoin | 6 " |
| Cascarilla bark | 5 " |
| Cloves | 2 " |
| Cassia bark | 2 " |
| Mix and grind. | |

GLOSSARY.

Adipis—Wool fat.

Aguru—Aloes wood, agar, kayagahru.

Ajawan—Jowan, vova, omum, samhun.

Akanda—Arka, madar, ekka, erikka.

Alkanet—Rang pata.

Ambergris—A fragrant substance found in the intestines
of spermaceti whales.

Aniseed—Mauri, muhuri, sourif, sewa, kuppi.

Bay rum—Rum distilled from bayberry.

Belenic myrobalan—Bahera, sagona, yella.

Benzoin—Luban, hussi, shambirani, kaminian.

Bhimraj—Wedelia calendulacea.

Bloodstone—Hard hematite.

Blue vitriol—Copper sulphate, tuntia.

Capsicum—Lal or gachmarichi, red pepper.

Cassia—Tejpat, sinkami, kakra, tamala, zarnal.

Chebulic myrobalan—Haritaki, harra, imachi, hirada.

Chua—Dregs in sandal wood oil.

Costus—Puskara, pachak, kust, gostan.

Cream of tartar—Potassium hydrogen tartrate.

Dammar—Dhupada, kahruba, ral, sandras.

Emblic myrobalan—Amla, amlaki, daula, tappi.

Ext. Glybriza—Liquorice extract.

- Ferrous Sulphate*—Hirakash, copperas.
Gugul—Gum bdellium, guggul, kukkulu.
Gum ammoniacum—A gum from Persia and Khorasan.
Hartshorn—Horns of a stag.
Ipecacuanha—Tinpani, trifolio, nela-naringa.
Jatamansi—Indian spikenard, bhut-jatt.
Kesutya—An indigenous herb.
Lakhi—A variety of round oysters.
Liquorice—Jaista madhu, mithi lakdi.
Litharge—Oxide of lead, murdosing.
Lodhwood—Khoildai, singen, ludduga.
Mace—Jatri, jati, jadipatturi.
Marking nut—Bhela, bibha, bhuamu.
Mastic—Rumi mastiki, kundur rumi, arah.
Myrrh—Sumudraguggul, bol, hirabol.
Nagarmoth—Mustaka, kora, lavalala.
Nilotpola—Nilofor, a kind of lotus.
Nutgall—Majuphal.
Nutmeg—Japhal, javantri, jajikaya, jadikay.
Ochre—Metallic oxides, yellow, red and brown.
Olibanum—Salhe, salai, kundur, luba, anduku, guggar, guggulu, dhup, chittu, bastaj.
Opodeldoc—Ordinary soap liniment containing a higher percentage of soap.
Orpiment—Hantal.
Parsley—Randhuni.

Pearl ash—Potassium carbonate.

Pipe, clay—A kind of clay akin to china clay, kaolin.

Prirangu—*Aglaia roxburgiana*.

Pumice—Lava composed mainly of silicate of aluminium.

Putty—Mixture of whiting and linseed oil.

Red sanders—*Rakta chandan*.

Rock alum—Alum crystals.

Sal-ammoniac—Ammonium chloride, nusadal.

Sandarac—A kind of gum.

Sesame—*Til*, gingelly, *tir*, *tal*, *rasi*, *khasi*.

Soda ash—Sodium carbonate.

Soap liniment—Prep. Hard soap 2oz.; camphor 1 oz.; rosemary oil 3 dr.; rectified spirit 16 oz.; distilled water 4 oz. Mix the water and spirit, add the other ingredients, digest at below 70°F, agitate occasionally 7 days and filter.

Suet—Animal fat.

Surma—Ore of lead sulphide.

Sweet oil—Sesame oil, olive oil, etc.

Talc—Steatite, soapstone.

Tragacanth—A kind of gum.

Tripoli—Impalpable silicious earth.

Verdigris—Green basic copper acetate, zangar.

Vertiver—*Khus* root.

Waterglass—Aqueous solution of sodium silicate.

Whiting—Pure chalk.